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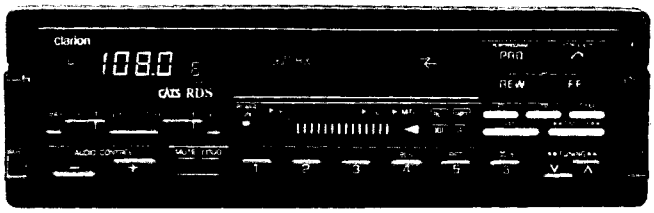
clarion Service Manual

Published by Service Administration Section



RDS/FM•MPX/MW/LW RADIO CASSETTE COMBINATION

Model 971HX (PE-9187A)

■SPECIFICATIONS:

Radio section

Circuit system:	Superheterodyne
Tuning system:	Electronic tuning
Receiving frequency:	LW 153kHz to 281kHz
	MW 531kHz to 1,602kHz
	UKW(FM)
	87.5MHz to 108MHz
Intermediate frequency:	
	LW, MW 459kHz
	UKW(FM) 10.7MHz

Tape section

Reproduction system:	Auto reversing
	4 track, 2 channel stereo cassette tape playback (Monaural also capable)
Tape speed:	4.76cm/sec. (1-7/8 ips)

Composite

Load impedance:	4Ω×2
Power output:	27W+27W
Power supply voltage:	
	DC 14.4V(10.8V to 15.6V)
	Negative ground
Power consumption:	Less than 7A
	(at max. output)
Dimensions:	Width 181.5mm
	Height 52.5mm
	Depth 160mm
Weight:	2.1kg

- Dolby noise reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- "Dolby" and the double-D symbol ⊡⊡ are trademarks of Dolby Laboratories Licensing Corporation.

■COMPONENTS:

●971HX (PE-9187A-A)

Main unit		1
Guide label	285-1097-05	1
Pass card	287-1556-00	1
Mounting bracket	300-6954-00	1
Extension lead	854-0960-00	1
Parts bag	921-8319-00	1
Key	330-8580-00	2
Spacer	345-3653-01	1
Tap screw	700-5016-80	1
Hex-nut	723-5000-21	1
Plate nut	725-0216-00	1
Flat washer	740-5000-10	1
Parts bag	921-8477-00	1
Customer card	283-0184-01	1
Sticker	291-0041-00	2

■FEATURES:

- ■RDS (Radio Data System)
  - PI (Program Identification)
  - AF (Alternative Frequencies)
  - TP (Traffic Program Identification)
  - TA (Traffic Announcement)
- ■PS Adapter Input Terminal (Program Service Name)
- ■SAM for MW/LW
- ■SAM I for FM (6 FM)...Signal Auto Memory
- ■Super SASC II & CZ1...Signal Actuated Stereo Control
- ■Auto DX/LO for SEEK
- ■Full Logic Control Operation

- Key-Off Pinchroller Release
- Amorphous Head
- Dual Azimuth Adjustment Mechanism
- Automatic 70μS Tape Equalization Select (MTL)
- APC (AUTOMATIC PROGRAM CONTROL)
- Blank Skip & Repeat
- Dolby® B Noise Reduction
- Electronic Audio Mode Selector and Level Control (Volume, Balance, and Fader)
- BASS/TREBLE, LOUDNESS, MUTING, FADER
- Maximum Power Output 27W+27W
- CATS (Computer Anti-Theft System)
- TAKE AWAY (Unit with Slide Out Bracket)
- CD/DAT Input Terminal

■CATS III (Computer Anti-Theft System III)

1. Operation

[1] Entering the CATS Code No.

1. Turn the power off (switch OFF).
2. Press the switch, and while keeping it down press the switch.

Digital Display

0000 indication starts blinking

3. Input an arbitrary 4-digit number using the Preset Switches (1 to 6).

(Example) Input 1-2-3-4

0000 starts blinking again

4. Input the same four digits again.

CATS Code No. input completed. Now the unit will operate normally.

(Example) Input 1-2-3-4

Notes:

1. Do not forget your CATS Code No. In the event that you lose your CATS Card and forget your CATS Code No., your dealer can send the unit to the factory to have the CATS Code No erased; but only if you can prove you are the rightful owner of the unit.
2. In case you have input a wrong 4-digit number in step 3 of "Entering the CATS Code No.":
   If you have input, for example, 2-2-3-4 instead of 1-2-3-4, input any 4-digit number other than 2-2-3-4 in step 4. The unit will return to the condition in step 2, where the CATS indication starts blinking. Continue by keying in the correct CATS Code No.
3. If the input numbers in step 3 and 4 do not match.
   If you input, for example, 1-2-3-4 in step 3 and then 2-2-3-4 in step 4, the unit will return to its original condition. Continue with steps 3 and 4.
4. In case you realize your mistake before entering all 4 digits in step 3 or 4, enter any digits to complete the input. Then proceed as explained in notes 2 or 3 above.
   Proceed in the same way to correct input mistakes made during [2] Releasing CATS or [3] Erasing CATS No. procedures.

[2] Releasing CATS (when you have removed the car stereo or sent the car for servicing)

1. Turn the power on (switch ON.)

Digital Display

0000 indication starts blinking

2. Input your CATS Code No.

(Example) Input 1-2-3-4

[3] Erasing and Changing the CATS Code No.

1. Turn the power off (switch OFF).
2. Press the switch, and while keeping it down press the switch.

Digital Display

0000 indication starts blinking

3. Input your CATS Code No.

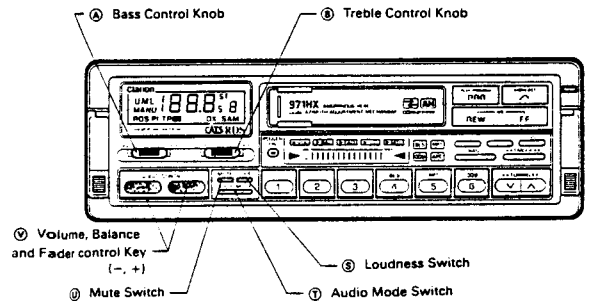
CATS Code No. erasure completed. Now the unit will operate normally.
To input a new CATS Code No., follow procedure [1].

Note:

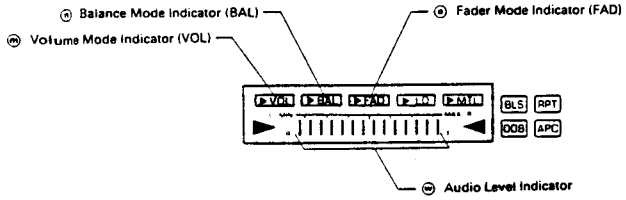
1. In case you input a wrong CATS Code No. in step 3, the unit will return to the condition after step 1, so continue with steps 2 and 3.

■OPERATION:

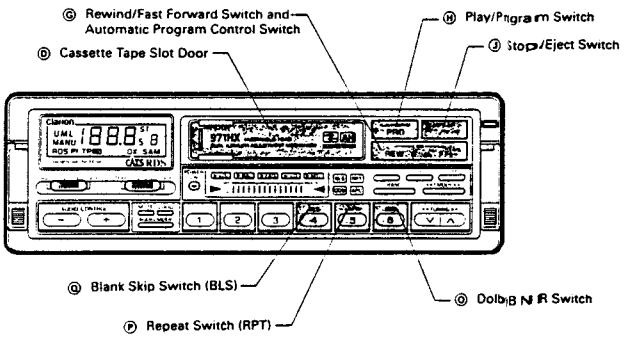
General Section


Ⓐ Bass Control Knob
Ⓑ Treble Control Knob
Ⓥ Volume, Balance and Fader control Key (−, +)
Ⓤ Mute Switch
Ⓢ Loudness Switch
Ⓣ Audio Mode Switch

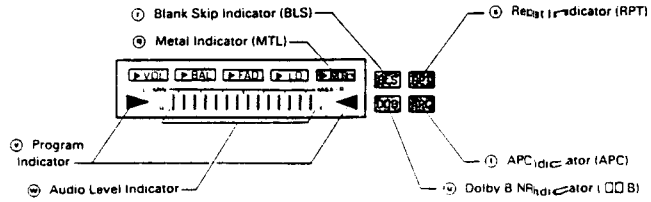
■ AUDIO AND TAPE MODE DISPLAY



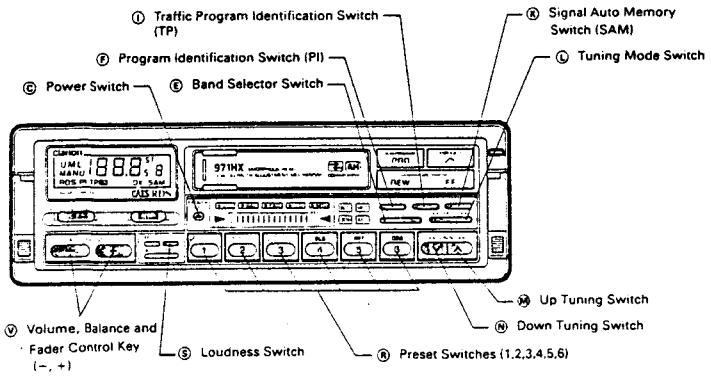
Cassette Tape Section


Ⓖ Rewind/Fast Forward Switch and Automatic Program Control Switch
Ⓓ Cassette Tape Slot Door
Ⓗ Play/Program Switch
Ⓙ Stop/Eject Switch
Ⓠ Blank Skip Switch (BLS)
Ⓟ Repeat Switch (RPT)
Ⓠ Dolby B NR Switch

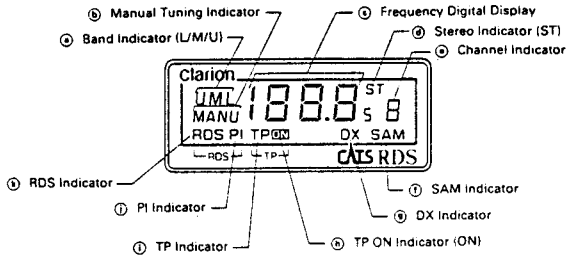
■ AUDIO AND TAPE MODE DISPLAY


Ⓘ Blank Skip Indicator (BLS)
Ⓚ Metal Indicator (MTL)
Ⓟ Repeat Indicator (RPT)
Ⓡ Program Indicator
Ⓘ APC Indicator (APC)
Ⓛ Audio Level Indicator
Ⓠ Dolby B NR Indicator (DOLBY B)

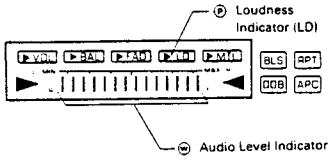
Radio Section


① Traffic Program Identification Switch (TP)
Ⓚ Signal Auto Memory Switch (SAM)
Ⓕ Program Identification Switch (PI)
Ⓛ Tuning Mode Switch
Ⓒ Power Switch
Ⓔ Band Selector Switch
Ⓜ Up Tuning Switch
Ⓝ Down Tuning Switch
Ⓥ Volume, Balance and Fader Control Key (−, +)
Ⓢ Loudness Switch
Ⓡ Preset Switches (1,2,3,4,5,6)

■ TUNER MODE DISPLAY



■ AUDIO AND TAPE MODE DISPLAY



- **DK (Durchsage Kennung) (TA: Traffic Information) Volume**

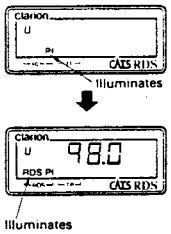
✱ **DK (TA) Volume** ☛ Ⓢ, Ⓥ, Ⓦ
This function is used to set the volume of traffic programs. If this is set higher than the volume you usually use when listening to tapes or the radio, you will not risk missing the traffic information.
Press and hold the "LOUD" switch, then press the "AUDIO CONTROL" up or down switch. The volume is adjustable in seven steps, and the level indicator is shown on the display.

✱ **PI (Program Identification) Switch** ☛ Ⓕ, Ⓛ, ⓘ
RDS broadcasts are automatically searched and received. Next, if the same program is being broadcast on two or more stations, the station with the clearest reception is automatically selected and received.
This eliminates the need for retuning when driving far from home.

Note: This function is only for reception of RDS broadcasts.

1. When the switch is pressed, the "PI" indicator lights, and the unit is set to the standby OK mode.
2. When an RDS broadcast is received, "RDS" appears on the display.

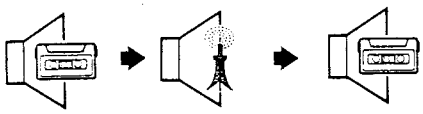
- When the seek function is used with the PI switch on, only RDS broadcasts will be tuned in. (Stations broadcasting the same program will not be tuned in.)
- When the SAM operation is performed with the PI switch on, only RDS stations will be set in the memory.

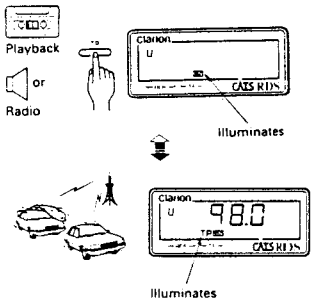


✱ **TP (Traffic Program) Switch** ☛ Ⓖ, ⓘ, ⓗ
When this switch is pressed, the ON indicator appears on the display. If an FM broadcast is being received or the cassette deck is operating and traffic information is broadcast while an FM station is displayed (" " band indicator), the "TP" indicator will appear on the display and the traffic program will automatically be received. This system can be used even outside of ARI* broadcast areas if traffic information is being broadcast in RDS in that area.
If the operation switches to the traffic program while a cassette tape is playing, the tape will automatically stop.
The tape is played after the traffic program is completed.
There is also a volume function (DK volume) to adjust only the volume of traffic programs. With this function, traffic programs are received with the volume you have preset, so you will not miss the traffic information even when listening to FM broadcasts or cassette tapes with the volume turned down.

Note: This function will not work in areas in which no traffic programs are broadcast.

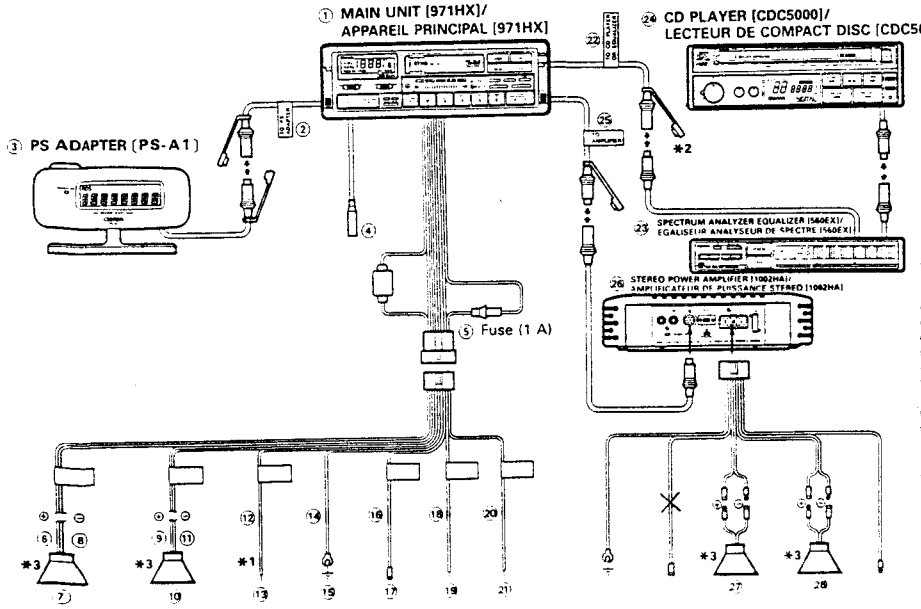
✱ ARI: Driver Radio Informations





- When the seek function is used with the TP switch on, only stations broadcasting traffic programs will be tuned in.
- When the SAM operation is performed with the TP switch on, only stations broadcasting traffic programs will be set in the memory.

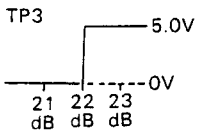
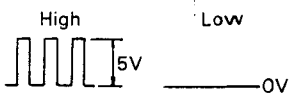
■WIRE CONNECTION/CABLAGE:



① **MAIN UNIT [971HX]**
② To PS Adapter (Blue)
③ **PS ADAPTER [PS-A1]**
④ FM(UKW)/MW/LW main antenna
⑤ Fuse (1 A)
⑥ White wire
⑦ **Front Left Speaker**
⑧ White/Black wire
⑨ Grey wire
⑩ **Front Right Speaker**
⑪ Grey/Black wire
⑫ Blue wire
⑬ Accessory +14.4 V
⑭ Black wire
⑮ Ground (Connect to vehicle metal chassis)
⑯ Blue/Yellow wire
⑰ Auto antenna
⑱ Red/White wire
⑲ Illumination +14.4 V
⑳ Red wire
㉑ +14.4 V (Connect directly to battery)
㉒ To CD player or spectrum analizer equalizer (Black)
㉓ **SPECTRUM ANALYZER EQUALIZER [560EX]**
㉔ **CD PLAYER [CDC5000]**
㉕ To amplifier (Gray)
㉖ **STEREO POWER AMPLIFIER [1002HA]**
㉗ **Rear Left Speaker**
㉘ **Rear Right Speaker**

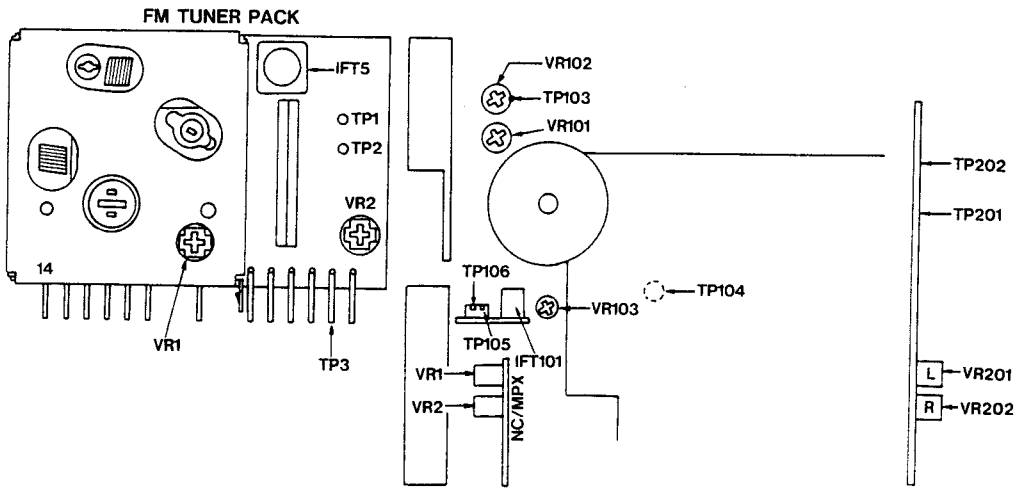
✱1. Connect the Accessory Lead of the unit so that power is switched on and off by the ignition key.
✱2. Do never remove the cap except when connecting an equalizer or CD player. If removed, no sound will be emitted.
✱3. Use 4 ohms impedance speakers with a maximum wattage rating greater than the amplifier maximum power output.

■ADJUSTMENT:

Adjustment item	Adjustment point	Procedure
0V	IFT5 (TUNER PACK)	1. Connect the digital voltmeter to TP1 and TP2. 2. Input the 98.0MHz/65dB signal (30% MOD) and adjust the reading of digital voltmeter to 0.000V± 30mV by IFT5.
0V (RDS)	IFT101	1. Connect the digital voltmeter to TP105 and TP106. 2. Follow the same adjustment steps as above. (IFT101)
Limiter	VR1 (TUNER PACK)	1. Input the 98.0MHz, 55dB SSG signal. 2. Adjust VR to make the set output 0dB (0.775V). 3. Reduce the output of SG 13dB. 4. Adjust VR1 untill output level decrease to 3dB.
SD	VR2 (TUNER PACK)	1. Input the 98.0MHz/22dB signal (30% MOD). 2. Adjust VR2 so that the voltage of TP3 is in the range 0V to 5V. 
S-meter	VR102	1. Connect the digital voltmeter to TP103. 2. Input the 98.0MHz frequency at 27dB (100% MOD) and adjust the level to 1.4±0.05V by VR102.
SASC	VR101	1. Input the 98.0MHz/65dB, 7kHz modulation frequency, 30% modulation degree SSG signal. 2. Adjust the output level of the volume controller to 0dBm (0.775V). 3. Set the SSG output to 38dB and adjust VR101 so that the output level is −2dB.
CW (Carrier Wave)	VR103	1. Input the 98.0MHz/55dB, 1kHz (MONO) modulation frequency, 0.6kHz modulation rate SSG signal. 2. Connect the oscilloscope to TP104. 3. Adjust VR103 so that the waveform of TP104 is in the range 5V to 0V. (0.6±0.2kHz) 
Separation	VR1 (NC/MPX)	1. Input the 98.0MHz, connect the output of a stereo modulator to the external modulation terminal, and inpu a 65dB SSG signal. 2. Set the stereo modulator to the L or R ch and adjust VR1 so that the maximum separation is obtained.
Pilot canceller	VR2 (NC/MPX)	1. Inpu the 98.0MHz/65dB, modulation (PL 10%). 2. Adjust VR2 so that output of the set is minimum.
Dolby NR	VR201 and VR202	Insert a Dolby level test tape (400Hz−200nWb/m), connect the milli-volt meter to TP201 and TP202, and adjust VR201 and VR202 to obtain an output of 385mV±1dB.

● SPECIFICATION −LIMIT− Quieting sensitivity: MW Less than 33dB (at 20dB S/N)
LW Less than 40dB (at 20dB S/N)
UKW Less than 12dB (at 30dB S/N)
Stereo separation: UKW More than 20dB

● ADJUSTMENT POINT



‹TAPE MECHANISM›

1. Head-azimuth Adjustment

Make playback for the azimuth-tape (8kHz, −10VU), and turn each azimuth-adjusting screw to make each FWD & REV maximum. After adjustment, make adhesion with bond.

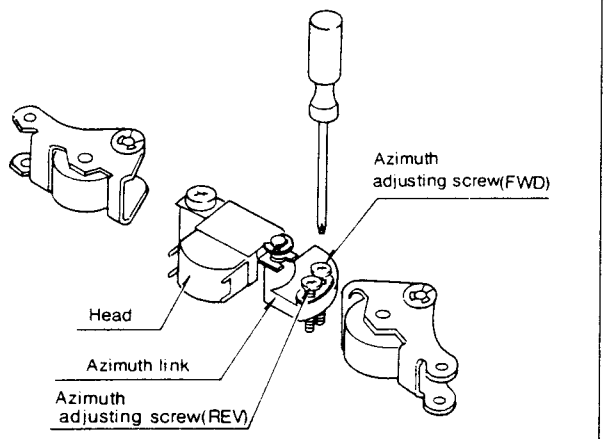


Fig. 1

2. Adjustment of Adsorption Plunger B

Under FF-operation, when adsorption plunger is released, mount the plunger to make the adsorption-surface of adsorption plunger B in parallel to the bent surface of plunger link B, and make adhesion of the rear side of the screw with bond.

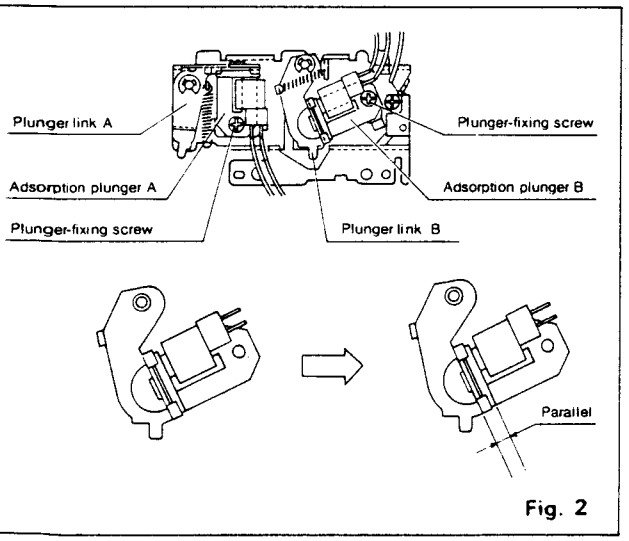


Fig. 2

3. Adjustment of Adsorption Plunger A

Under REW-operation, when adsorption plunger is released, mount the plunger to make the adsorption-surface of adsorption plunger A in parallel to the bent surface of plunger link A, and make adhesion of the rear side of the screw with bond.

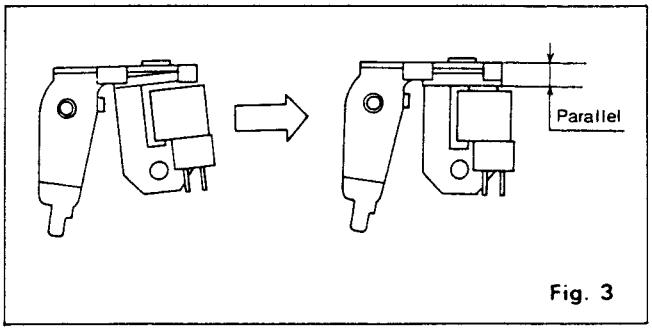


Fig. 3

● SPECIFICATION —LIMIT— Wow & flutter
: Less than 0.15%(W.R.M.S.)

■EXPLANATION OF IC's:

Refer to description in IC service manual vol 1.			
μPD4066BG	051-0267-55	Quad Bilateral Switch	P39

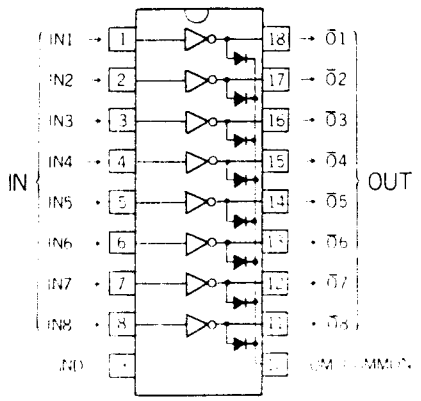
Refer to description in IC service manual vol 2.			
HA12438FP	051-0730-00	FM Frontend	P7
TA7411AP	051-0798-20	FM IF System	P8
NJM4558M	051-0350-55	Dual OP. Amp	P39
NJM2058M	051-0556-01	Quad OP. Amp	P41
M54563P	051-0569-00	Transistor Array	P44
LA2000C	051-0620-00	Music Interval Detection	P43
TA7705P	051-0714-00	Dual Pre Amp	P18
TA7270PCL	051-0655-01	19W Power Amp	P33
TA7271PCL	051-0656-01	19W Power Amp	P33

■M54522P 051-0570-00 Darlington transistor array

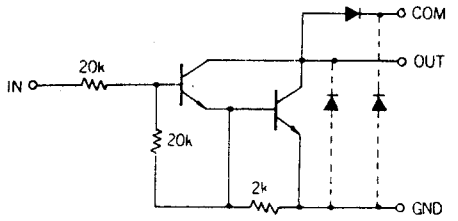
Absolute Maximum Ratings (Ta = −20 ~ +75°C)

Item	Symbol	Rating	Unit
C-E Sustaning voltage	V_{CEO}	40	V
Collector Current	I_C	400	mA
Input voltage	V_{IN}	40	V
Clamping Diode Forward Current	I_F	400	mA
Clamping Diode Reverse Voltage	V_R	40	V
Power Dissipation	P_D	1.79	W

Block Diagram



Equivalent Circuit

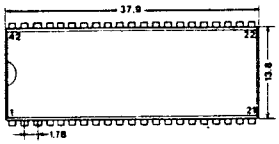


■LC7537N 051-0866-00 / LC7537AN 051-0866-05 Electronic Volume

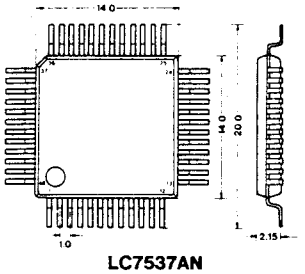
Outline

This IC is an electronic volume which can electronically controls functions, such as volume, balance, loudness, fader, bass and treble, using a few number of externally attached parts.

Outward Form



LC7537N



LC7537AN

Features

*It can control the following functions by 3-line type serial data of CE, DI and CLK. Since serial input is of 5V system, a general purpose microcomputer can be used.

1 Volume: 81 positions of 0dB through 79dB (1dB step) and $-\infty$. Provides a balance function by separately controlling L/R.

2 Loudness: Since there is a center tap at a −20dB position of the ladder resistor of the volume, loudness operation is available by means of an externally attached part for CR.

③ Fader: Provides a fader function by varying only rear output or front output over 16 positions [0dB through −20dB (at 2dB step), −20dB through 45dB (at 5dB step), −60dB and $-\infty$)].

④ Bass/treble: Controls bass and treble at 15 positions by 2dB step, forming an NF type tone control circuit (Baxandall type) through externally attached CR.

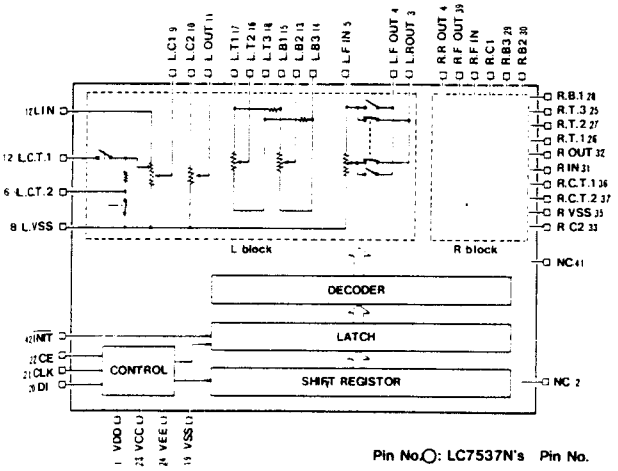
*An operationg voltage widely ranges from +4.5V to 15V because of its C-MOS structure, and either unilateral power supply can be used.

Absolute Maximum Ratings

($Ta=25°C$, $V_{SS}=0V$, $V_{DD} \geqq V_{CC} > V_{SS} \geqq V_{EE}$)

Item	Symbol	Condition	Rating	Unit
Supply voltage	$V_{DD}-V_{EE}$ max	V_{DD}, V_{EE} : $V_{EE} \geqq -8V$	16	V
	V_{CC} max	V_{CC} : $V_{DD} \geqq V_{CC}$	$V_{SS}-0.3 \sim V_{SS}+7$	V
Input impressed voltage	V_I 1	DI, CLK, CE	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
	V_I 2	INIT	$V_{EE}-0.3 \sim V_{DD}+0.3$	V
Power dissipation	Pd max	Ta≦85°C	200	mW

Block Diagram



Pin No.○: LC7537N's Pin No.

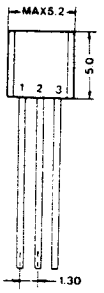
Terminal Connection Table

Pin No. LC7537N	Pin No. LC7537AN	Function
12	8	L.IN
31	29	R.IN
9	4	L.C1
34	33	R.C1
10	5	L.C2
33	32	R.C2
11	6	L.OUT
32	31	R.OUT
5	47	L.FIN
38	38	R.FIN
4	46	L.FOUT
3	45	L.ROUT
39	39	R.FOUT
40	40	R.ROUT
15	11	L.B1
16	9	L.B2
14	10	L.B3
28	26	R.B1
27	28	R.B2
29	27	R.B3
17	13	L.T1
16	12	L.T2
18	14	L.T3
26	24	R.T1
27	25	R.T2
25	23	R.T3

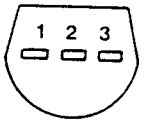
Pin No. LC7537N	Pin No. LC7537AN	Function
7	1	LCT1
6	48	LCT2
36	36	RCT1
37	37	RCT2
8	2	L.Vss
35	35	R.Vss
42	42	INIT
22	20	CE
20	16	DI
21	17	CLK
1	43	VDD
23	21	VCC
19	15	Vss
24	22	VEE
2	3	
41	7	
	18	
	30	NC
	34	
	41	
	44	
–	19	VDD(NC)

S-8052ALO 051-0820-00 / ■S-8054ALB 051-0821-00 / S-8054HN 051-0940-00 C-MOS Voltage Detector

Outward Form



Terminal Connection

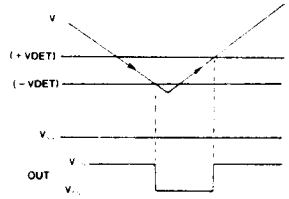


Bottom View

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	$V_{DD}-V_{SS}$	12.0	V
Input voltage	Vin	$V_{SS}-0.3 \sim V_{DD}+0.3$	
Output voltage	Vout	$V_{SS}-0.3 \sim V_{DD}+0.3$	
Output current	Iout	50	mA
Power dissipation	Pd	200	mW

Operating Timing Chart

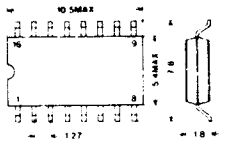


Electrical Characteristics

Item	Symbol	IC	MIN	TYP.	MAX	Unit
Detect voltage	−VDET	S-8052ALO	2.395	−VDET	2.605	V
		S-8054ALB	3.995	−VDET	4.305	
		S-8054HN	3.80	−VDET	4.2	
Operating voltage	V_{DD}	S-8052ALO	1.5		10.0	V
		S-8054ALB	1.6		10.0	
		S-8054HN	1.6		10.0	

■TC74HC123F 051-1139-05 DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR

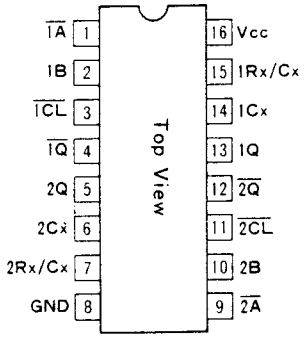
Outward Form



Outline

This IC is a monostable multivibrator which has 2 high-speed CMOS circuits. For trigger inputs, there are $\overline{A}$ input, which triggers at a fall edge, and B input and $\overline{CL}$ input which trigger at a rise edge. As they are all Schmidt trigger inputs, they securely operate even when a rise or fall time is long ($t_r = t_f = 1s.$). Once triggered, an output continues a constant-time single stable mode which is determined by an external resistor and a condenser, as far as the $\overline{CL}$ input is set to "L". If another trigger input is given within a single stable time, that trigger also becomes valid to allow the single stable mode to be maintained.

Terminal Connection



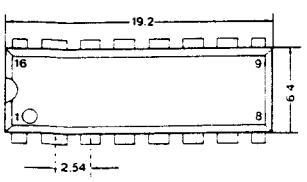
Truth Table

INPUTS			OUTPUTS		NOTE
$\overline{A}$	B	$\overline{CL}$	Q	$\overline{Q}$	
↓	H	H	⌐	⌙	OUTPUT ENABLE
*	L	H	L	H	INHIBIT
H	*	H	L	H	INHIBIT
L	↑	H	⌐	⌙	OUTPUT ENABLE
L	H	↑	⌐	⌙	OUTPUT ENABLE
*	*	L	L	H	INHIBIT

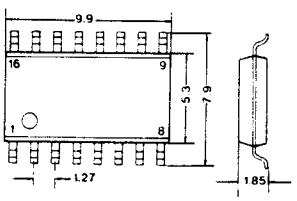
* : DON'T CARE

■CXA1102P 051-1038-00 Dolby B Type Noise Reduction System
■CXA1102M 051-1038-01

Outward Form



051-1038-00

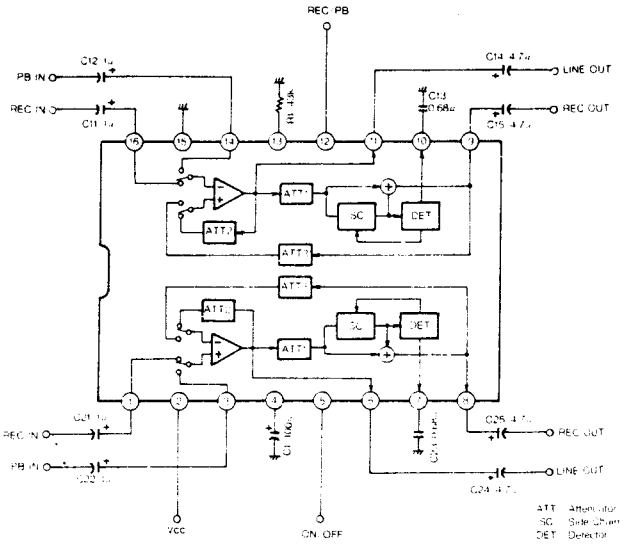


051-1038-01

General Description

This IC is integrated circuits including two separate Dolby B type noise reduction processors. Six devices with four Dolby levels

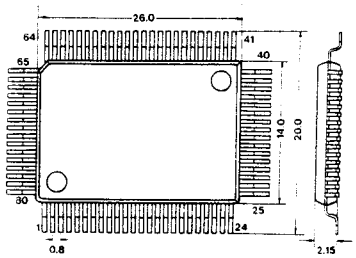
Block Diagram



Pin No.	Symbol	Description
1, 16	REC IN	Recording (Encode) input.
2	Vcc	Power supply
3, 14	PB IN	Play Back (Decode) input.
4	Vcc/2	Single Supply → Vcc/2. Split Supply → Ground.
5	ON/OFF	Mode control terminal for NR ON/OFF. "H" → NR OFF "L" → NR ON
6, 11	LINE OUT	Line (Decode) output.
7, 10	TC	Time constant terminal for the level detector
8, 9	REC OUT	Recording (Encode) output.
12	REC/PB	Mode control terminal for REC/PB (Encode/Decode). "H" → PB (Decode) "L" → REC (Encode)
13	IREF	Reference current input terminal for the active filters.
15	GND	Single Supply → Ground. Split Supply → Vee.

■LC7230-8218 051-1141-00 Tuner controller

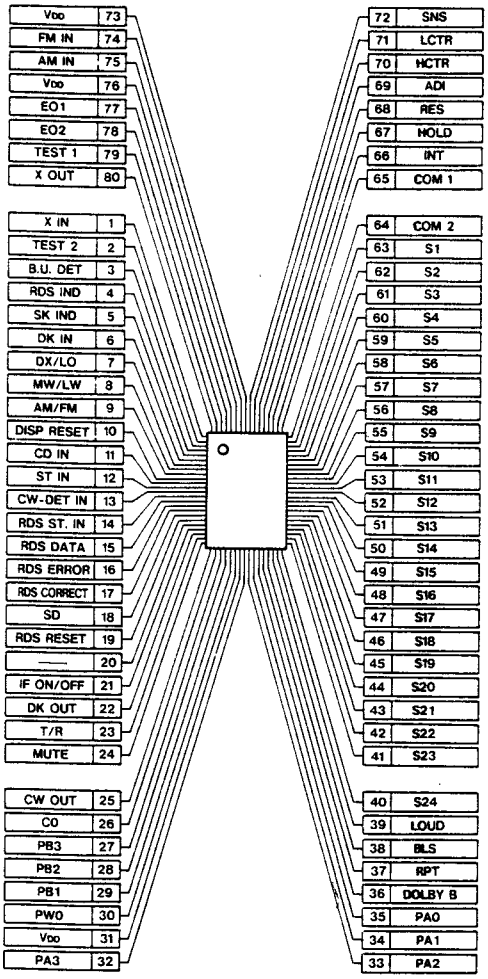
I. Outward Form



II. Maximum Ratings (Ta=25°C)

Item	Symbol	Condition	Rating	Unit
Supply voltage	V_{DD}	———	−0.3 – 6.5	V
Input voltage	$V_{IN}(1)$	Pin 3 – 6, 66, 68, 72 terminals	−0.3 – 6.5	V
	$V_{IN}(2)$	Pin 67 terminal	−0.3 – 13	V
	$V_{IN}(3)$	Input other than $V_{IN}(1)$	−0.3 – V_{DD} +0.3	V
Output voltage	$V_{OUT}(1)$	Pin 7 – 10 terminals	−0.3 – 15	V
	$V_{OUT}(2)$	Output other than $V_{OUT}(1)$	−0.3 – V_{DD} +0.3	V
Power dissipation	Pd	−40°C – +85°C	400	mW

Ⅲ. Terminal Connection



Ⅳ. Terminal Connection Table

Pin No.	Symbol	Function	I/O
1 80	X IN X OUT	Terminal for connecting an crystal resonator. (4.5MHz)	I/O
2 79	TEST 2 TEST 1	LSI test pin to be connected to the open or the ground.	–
3	BACK UP DET	When this pin is "L", the microcomputer goes into the BACK UP mode.	I
4	RDS IND	RDS indicator driving input pin. Active : Low	
5	SK IND	SK indicator driving input pin. Active : Low	
6	DK IN	DK discriminating signal input pin. Active : Low	
7	DX/LO	DX/Local automatic changeover output pin. DX : High LO : Low	O
8	MW/LW	MW/LW band changeover output pin MW : Low LW : High	
9	AM/FM	MW/UKW band changeover output pin. AM : Low FM : High	
10	DISP RESET	Display reset output pin. Active : Low	
11	CD IN	CD ON signal input pin. Active : High	I
12	ST IN	Stereo signal input terminal. Active : Low	
13	CW-DET IN	FM CW detection input pin. Active : Low	
14	RDS START IN	RDS data start signal input pin.	
15	RDS DATA	RDS data input pin.	I/O
16	RDS ERROR	RDS data error/discrimination input pin	
17	RDS CORRECTION	RDS data correction/discrimination input pin.	
22	DK OUT	DK output terminal. Active : Low	O
23	T/R	Audio source output pin in TAPE/RADIO mode. TAPE mode : High RADIO mode : Low	O
24	MUTE	Muting signal output. Active : Low	
25	CW OUT	CW output terminal. Active : High	
26 27 28 29 30	PC0 PB3 PB2 PB1 PB0	Key return signal terminals for key matrix.	O
31 73	V_{DD}	Power supply terminal of the device.	–
32 33 34 35	PA3 PA2 PA1 PA0	Key matrix signal input terminal. Attach pull-down resistance.	I
36	DOLBY-B	Dolby control signal output pin. For DOLBY : ON, Active-high for 50mS (MECH MI-COM enable) For DOLBY : ON, Active-high (MECH MI-COM disable)	O
37	RPT/MTL	RPT/MTL control signal pin in TAPE mode. For RPT : ON, Active-high for 50mS (MECH MI-COM enable) For MTL : ON, Active-high (MECH MI-COM disable)	
38	BLS/APC	BLS/APC control signal pin in TAPE mode. For BLS : ON, Active-high for 50mS (MECH MI-COM enable) For APC : ON, Active-high (MECH MI-COM disable)	
39	LOUD	LOUD control signal pin in TAPE mode. For LOUD : ON, Active-high	
40 ↓ 63	S24 ↓ S1	Segment signal terminals for LCD panel.	O
64 65	COM1 COM2	Common signal output terminals for LCD panel.	O
66	RDS CLK INT	Interrupt request input pin.	I
67	$\overline{HOLD}$	Input pin for setting the HOLD mode.	I
68	$\overline{RES}$	Reset signal input terminal.	I
69	ADI	A/D converter input pin.	I
70	HCTR	Universal counter input terminal. For FM IF counter.	I
71	LCTR	Universal counter input terminal. For AM IF counter.	I
72	$\overline{SNS}$	Input pin for deciding if a power failure occurs in the BACK UP mode.	I
74	FM IN	FM Local oscillation signal input.	I
75	AM IN	AM Local oscillation signal input.	I
76	GND	Ground.	–
77 78	EO1 EO2	The charge pump outputs of the phase detectors which consist of PLL. Unlock time allows the output of errors. EO1 & EO2 allow the outputs in the same waveform and therefore either of them can be used.	O

Ⅴ. Key Matrix

§ 1. Key Matrix Connection Table

Key In / Key Out	PA0 (Pin 35)	PA1 (Pin 34)	PA2 (Pin 33)	PA3 (Pin 32)
PC0 (Pin 26)	MECH MI-COM ENABLE/DISABLE	RDS AVAIL/UNAVAIL	R/T SEL	TAPE FW/REV
PB0 (Pin 30)	M1	M2	M3	M4/BLS/APC
PB1 (Pin 29)	TUNE UP	BAND	M5/RPT/MTL	M6/DOLBY B
PB2 (Pin 28)	TUNE DOWN	T-MODE	PSS	LOUD
PB3 (Pin 27)	PI/ART	TP	SAM	—

Diode SW　　Momentary SW

Transistor SW

§ 2. Diode SW

In the Table below, "0" means the diode switch is OFF (Open) and "1" does the diode switch is ON (Short).

Switch name	Function
MECH MI-COM ENABLE/DISABLE	Mechanical microcomputer enable/disable switch. OFF : Mechanical microcomputer enable mode ON : Mechanical microcomputer disable mode
RDS AVAIL/UNAVAIL	RDS function available/unavailable setting switch. OFF : RDS available mode The RDS/ART key allows the automatic follow-up operation. RDS display for FM mode ON : RDS unavailable mode The RDS/ART key allows the automatic retune ON/OFF operation. ART display for FM mode

§ 3. Transistor SW

Switch name	Function
R/T SEL	TAPE/RADIO changeover signal switch. OFF : TAPE mode This switch serves as the M4 to M6 keys and the TAPE key. Note: In the mechanical microcomputer disable mode, the switch provides the traveling display (◀▶), APC, MTL, and DD displays. ON : RADIO mode This switch serves as the M4 to M6 keys and the RADIO key.
TAPE FOW/REV	Tape FOW/REV display changeover switch. OFF : ▶ display ON : ◀ display

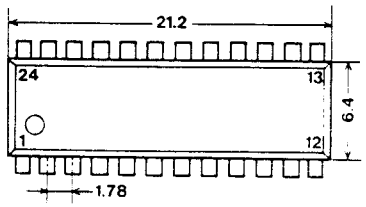
§ 4. Momentary SW

Switch name	Function
M1 – M6 BLS/APC RPT/MTL DD B	o RADIO mode Preset memory writing/calling keys. One button allows the independent writing into memory in each band of FM, FM SAM, and MW/LW. 〈Writing into memory〉 Continuous press of the "M1" to "M6" keys for 2 sec. or more allows the writing into M1 to M6. Muting applied during 2 sec. press is released after completion of writing. 〈Calling memory〉 Pressing the key within 2 sec. allows the memory calling. Muting applied is released after completion of calling. (No muting is applied if the memory calling is carried out in the same frequency.) The LCD channel (CH) indicator is lit up when the "M1" to "M6" keys are pressed, displaying the receive frequency equivalent to the frequency when the key is released. o TAPE mode ①Cassette mechanical microcomputer enable mode When each function is turned ON, each port generates the High output for 50ms. M4/BLS (Blank skip) M5/RPT (Repeat) M6/ DD B (Dolby-B) ②Cassette mechanical microcomputer disable mode When each function is turned ON, each port inverses the output. M4/APC M5/MTL M6/ DD B (Dolby-B)
TUNE UP TUNE DOWN	o MANUAL tuning UP/DOWN ①When the MANUAL mode is set by operating the "T-MODE" key, tuning can be operated by using the "UP" or "DOWN" key. ②Short press of the key within 0.5 sec. provides 1 step UP or DOWN. ③Continuous press of the key for 0.5 sec. or more provides the continuous feeding, and release of the key stops the feeding. o SEEK tuning UP/DOWN ①In the SEEK mode, tuning can be operated by using the "UP" or "DOWN" key. Usually, the SEEK mode is set (the SEEK mode is returned from the MANUAL mode for 5 sec. or by operating the "T-MODE" key). ②The SEEK tuning starts, detecting the SD signal, S meter signal, and IF counter. When the signal is judged to be detected in the station, the SEEK tuning stops, setting the last channel data to the same level as the receiving station. The SEEK tuning stops after three rounds in order of LO, DX, and DX mode.
BAND	Receiving band changeover key. The receiving band change each time this key is pressed. ┌→ UKW → MW/LW ─┐
T-MODE	SEEK/MANUAL tuning changeover key. The SEEK mode is usually selected. Upon press of this key, the MANUAL mode for the TUNE UP/DOWN key is selected for 5 sec. in the MANUAL tuning mode.

Switch name	Function
PSS	①The content of preset memory is called in serial order every 5 sec. ②When the "PSS" key is pressed, the station is received in serial order every 5 sec. from the preset memory one larger number than the current preset memory. After receiving the station from M6, the station is received returing to M1. When the channel number is not displayed, the station is received starting from M1. ③When the preset station is being called, the station in which the SD signal is not detected is skipped. ④During scanning of the memory, the channel number of the preset station being held is made flashing. ⑤If the "PSS" is pressed again during hold, the station in which the last SD signal is detected is called, causing the operation to stop.
LOUD	LOUD ON/OFF select SW.
RDS/ART	Changeover key for deciding to perform the next operation by pressing the PI key. ①RDS enable mode (for RDS ON when the PI key is pressed) FM: Automatic follow-up of the same program station on receipt of the RDS station AM: Irrelevant ②RDS disable mode (for RDS OFF when the PI key is pressed) Counting the Non-active SD performs the auto retune operation. 〈ART operation〉 When the FM station being received goes into the receive disable state (SD has not been detected for 26 sec.), the SEEK-UP starts from the LOCAL mode.
TP	a. RDS enable mode FM: Changeover for receiving the traffic information station only AM: Irrelevant b. RDS disable mode FM/AM: Irrelevant 〈Auto TP Retune operation〉 a. When TP is turned ON from OFF, neither TF nor SK of RDS-DATA being detected, the SEEK-UP starts from the LOCAL mode. b. When the receive frequency is changed with TP ON, neither TP nor SK of RDS-DATA being detected in newly received station, the SEEK-UP starts from the LOCAL mode. c. When the (RDS-DATA TP or SK) and SD signals are not continuously detected for 26 sec. during receiving with TP ON, the SEEK-UP starts from the LOCAL mode.
SAM	a. FM Within 2 sec: Changeover from FM band to FMSAM band or auto store stop. More than 2 sec: Auto store into FMSAM band. b. AM Within 2 sec: Irrelevant. More than 2 sec: Auto store into AM band. 〈SAM operation〉 ①When the "SAM" key is kept ON for 2 sec. or more, the auto search starts after 2 sec. When the station is caught, it is stored in serial order into the preset memories M1 to M6. At the start of auto search, the search is carried out in the frequency one step larger than the receive frequency. a. FM The station caught through search is stored into the rear side of preset memories M1 to M6. b. AM The station caught through search is stored into the preset memories M1 to M6. ②During execution of SAM, [SAM] and CH-NO of the channel next to be stored are made flashing. ③The station in the same frequency is not stored through one-time auto store.

■LA2231 051-1144-00 RDS Decoder

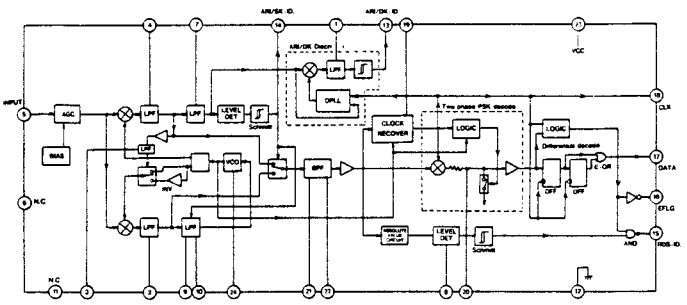
Outward Form



Function

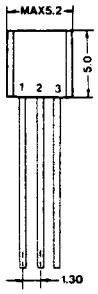
(1) DSB demodulation.
(2) Sub-carrier wave regeneration.
(3) Bit rate clock regeneration.
(4) Data differential decoding.
(5) ARI-SK discrimination.
(6) ARI-DK discrimination.
(7) RDS indicator driving.
(8) ARI indicator driving.
(9) Data error indicating output.

Block Diagram

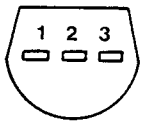


S-8052ALO 051-0820-00
■S-8053ALR 051-1148-00 C-MOS Voltage Detector
S-8054ALB 051-0821-00

Outward Form



Terminal Connection



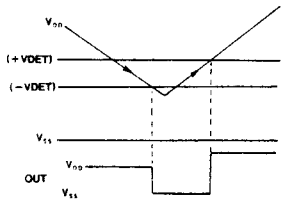
1. OUT
2. V_{DD}
3. V_{SS}

Bottom View

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	$V_{DD}-V_{SS}$	12.0	V
Input voltage	Vin	$V_{SS}-0.3 \sim V_{DD}+0.3$	
Output voltage	Vout	$V_{SS}-0.3 \sim V_{DD}+0.3$	
Output current	Iout	50	mA
Power dissipation	Pd	200	mW

Operating Timing Chart

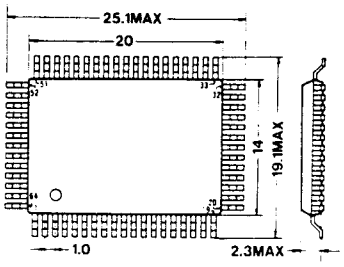


Electrical Characteristics

Item	Symbol	IC	MIN.	TYP	MAX.	Unit
Detect voltage	−VDET	S-8052ALO S-8053ALR	2.395 3.095	−VDET	2.605 3.405	V
		S-8054ALB	3.995	−VDET	4.305	
Operating voltage	V_{DD}	S-8052ALO	1.5		10.0	V
		S-8053ALR S-8054ALB	1.6		10.0	

■μPD75106G-550-1B 051-1149-00 Cassette Mechanism Controller

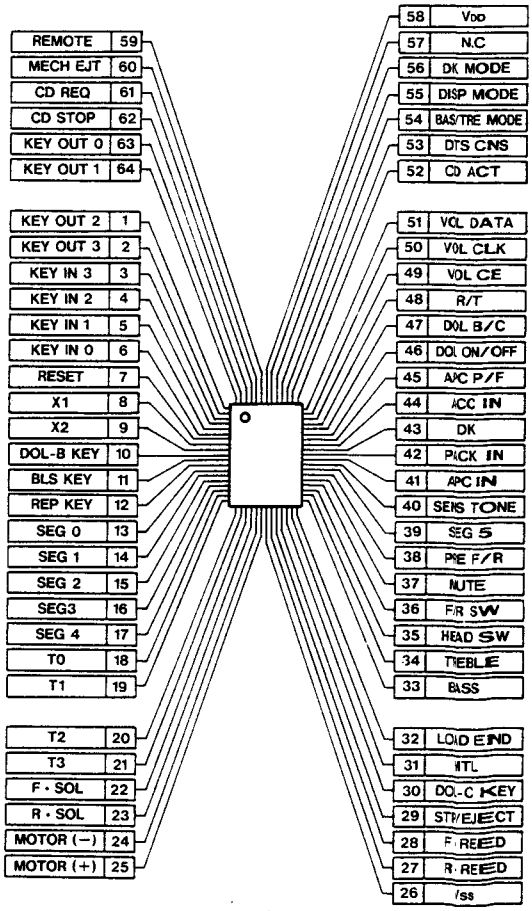
I. Outward Form



II. Outline of Functions

Controls the motor of the deck and the input switch of Radio and CD by using μPD75106.
(1) Electronic volume control.
(2) Music search system (APC, Blank skip, Repeat).
(3) Auto reverse system.
(4) Radio monitor function.
(5) Volume setting on DK.
(6) Tape pause function.
(7) Running indicator function.
(8) DK interruption function.

III. Terminal Connection



IV. Terminal Connection Table

Terminal No	Terminal name	In/Out (ACTIVE)	Function
63 64 1 2	KEY OUT 0 KEY OUT 3	O (H)	Key scan signal output terminal
3 6	KEY IN 3 KEY IN 0	I (H)	Key return signal input terminal
7	RESET	I (L)	Reset input terminal
8 9	X1 X2		Connection terminal for crystal oscillator 4.19MHz

Terminal No.	Terminal name	In/Out (ACTIVE)	Function
10 11 12	DOL-B BLS REP	I (H)	Input for DOL-B, BLS and REP key.
13 17	SEG 0 SEG 4	O (H)	SEGMENT signal output terminals to the LED panel
18 21	T0 T3	O (H)	DIGIT output terminals to the LED panel
22 23	F · SOL R · SOL	O (H)	Mechanism solenoid control terminal
24	MOTOR(−)	O	Terminal for mechanism motor reverse rotation LOADING, PLAY, FF, REW, STOP→LOW EJECT→HIGH
25	MOTOR(+)	O	Terminal for mechanism motor normal rotation LOADING, PLAY, FF, REW→HIGH EJECT, STOP→LOW
26	Vss	–	GND terminal
27	R · REED	I	Lead SW on the mechanism REV side, repeating H and L during tape play. When the tape ends, either H or L is fixed.
28	F · REED	I	Lead SW on the mechanism FWD side, repeating H and L during tape play. When the tape ends, either H or L is fixed.
29	STOP/ EJECT	I (L)	STOP/EJECT key input terminal, also used for INT1. When ACC is OFF and the microcomputer is in STOP mode, EJECT can be made by releasing the STOP mode.
30	DOL-C	I (H)	Dolby-C key input terminal.
31	MTL	I (H)	Detection terminal for METAL tape. Reads at the beginning of play immediately after loading is completed and during ACC is ON. METAL →HIGH NORMAL→LOW
32	LOAD END	I (L)	Mechanism LOAD END input terminal.
33	BASS	I	BASS data input terminal, which changes data output in E-VOL by voltage.
34	TREBLE	I	TREBLE data input terminal, which functions in the same manner as BASS.
35	HEAD SW	I (H)	Detection terminal for HEAD position. When HEAD is applied→HIGH
36	F/R SW	I	Detection terminal for mechanism travel direction. FF →LOW REW→HIGH
37	MUTE	O (L)	MUTE output terminal.
38	PRE F/R	O	FWD/RWD signal is output to the PRE AMP. FWD→HIGH REV →LOW
39	SEG 5	O (H)	Segment output terminal.
40	SENSOR TONE	O (H)	Buzzer output is made during each key is ON. Also the output is made with intervals of 0.5sec. during head search in TAPE mode. (4kHz, 50ms)
41	APC IN	I	Detection terminal for track/no track during track selection Track →HIGH No track→LOW
42	PACK IN	I	Terminal to detect whether the mechanism is in PACK IN status or not PACK IN→LOW EJECT →HIGH
43	DK	I (L)	DK input terminal. However, receiving is only made during DK MODE 1 Refer to the items on DK MODE key of momentary SW.
44	ACC IN	I (H)	Detection terminal for ON/OFF of the ignition key SW ACC ON →HIGH ACC OFF→LOW
45	APC P/F	O	Output terminal to alternate the AUDIO LEVEL for input to the APC IN terminal during FF/REW PLAY →HIGH FF/REW→LOW
46	DOLBY ON/OFF	O (L)	Outputs LOW during DOLBY ON
47	DOLBY B/C	O	DOLBY B/C output terminal DOLBY B →HIGH DOLBY C →LOW
48	R/T	O	Output terminal of RADIO/TAPE state as audio source (Refer to momentary SW "RADIO ON" of "5" key matrix.) For radio →LOW For tape →HIGH
49	VOL CE	O (H)	Chip Enable terminal of the electronic volume
50	VOL CLK	O	Clock output terminal to the electronic volume
51	VOL DATA	O	Data output terminal to the electronic volume The above will be explained later in the section of sending the electronic volume

Terminal No.	Terminal name	In/Out (ACTIVE)	Function
52	CD ACT	O (H)	Indiates, with "HI", that CD sound is output in DTS μ-com on CD mode.
53	DTS CNS	–	Not in use.
54	BAS/TRE MODE	–	BAS/TRE Mode select terminal.
55	DISP MODE	–	DISP Mode select terminal.
56	DK MODE	–	DK Mode select terminal.
57	N.C	–	Not in use.
58	V_{DD}	–	Power supply terminal.
59	REMOTE	–	Power switch of pre-amplifier. Being set to Hi only with RADIO ON. Serves also for RADIO ON output.
60	MECH EJT	O (H)	Power switch for mechanism. Being set to Hi with RADIO ON, but changed to LOW after EJECT when EJECT takes place with STP/EJT key with ACC-OFF or RADIO OFF.
61	CD REQ	I (L)	ON signal of the CD is input.
62	CD STOP	O (H)	STOP signal of the CD is input. CD mode→LOW.

V. Key Matrix

§ 1 Key Matrix Table

Key In \ Key Out	KEY OUT 0 (Pin 63)	KEY OUT 1 (Pin 64)	KEY OUT 2 (Pin 1)	KEY OUT 3 (Pin 2)
KEY IN 0 (Pin 6)	DOLBY-B	AUDIO MODE	FF	DISP MODE
KEY IN 1 (Pin 5)	DOLBY-C	LOUD	REW	DK MODE
KEY IN 2 (Pin 4)	BLS	VOL UP	PLAY/PRO	BASS/TRE MODE
KEY IN 3 (Pin 3)	RPT	VOL DOWN	RADIO ON	MUTE

Momentary SW Diode SW

Note: Some of the sets equipped with this microcomputer are not provided with all the above keys.

§ 2 Diode SW

Symbol	Function
DISP MODE	This is a SW to set the display system of 7 LED. (Refer to AUDIO MODE of momentary SW.) OPEN (0) : ING-operation for running and audio SHORT(1) : Audio-display alone
DK MODE	This is a SW to set yes/no of the DK-interruption. OPEN (0) : No DK-interruption SHORT(1) : DK-interruption *DK-interruption means to make radio-mode with the highest priority when LOW was input to DK-terminal from the tuner as traffic information.
BASS/TRE MODE	Sets BASS/TRE control system. OPEN (0) : Switches BASS/TRE by UP/DWN key SHORT(1) : Switches BASS/TRE by externally mounted variable resistance

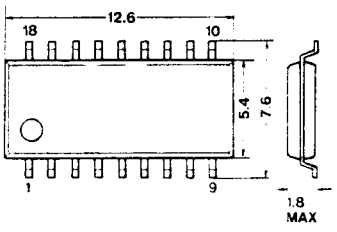
§ 3 Momentary SW

Symbol	Function
DOLBY-B	DOLBY-B ON/OFF key. Repeats ON/OFF whenever it is pressed. Outputs optionally to the DOLBY and DOLBY B/C ports after key operation.
DOLBY-C	DOLBY-C ON/OFF key. Repeats ON/OFF whenever it is pressed. Outputs optionally to the DOLBY and DOLBY B/C ports after key operation. As above, DOLBY B/C does not switch ON simultaneously. It is acceptable only during TAPE mode.
BLS	ON/OFF of Blank Skip is selected whenever this key is pressed. When a blank space of 12 seconds is detected between tracks during TAPE play with Blank Skip ON, the head search starts towards FF direction. After track head is detected, BACK PLAY is operated and the blank space is detected, then Program Change is made and the operation is completed.
RPT	ON/OFF of the Repeat is selected whenever this key is pressed. A same track can be repeatedly played with this function. When the track is not detected for 1.5 sec. after a track has been detected for 5 sec. during TAPE playing with Repeat ON, REW is operated and NO Track Detection is made, then TAPE plays.
AUDIO MODE	By pushing this key, the operator can choose whether or not to subject one of VOL, BAL, BAS, TRE and FAD to UP/DOWN key operation. However, BAS and TRE do not exist with BAS/TRE MODE being "1" since BAS and TRE have been input through AD conversion. a) BAS/TRE MODE="0" → VOL → BAL → BAS → TRE → FAD → b) BAS/TRE MODE="1" → VOL → BAL → FAD → The key, when pushed more than once within 10 seconds, repeats a) or b) above mentioned. However, with DISP MODE="0", when it is pushed with the current BAR display in RUN-ING display, "VOL" display always is obtained, followed by KEY on of either a) or b). In 10 seconds from key operation, DISP MODE="0" on RADIO, DK mode → VOL display on TAPE mode → RUN-ING display DISP MODE="1" always VOL display In CD mode, this stays as an invalid key.

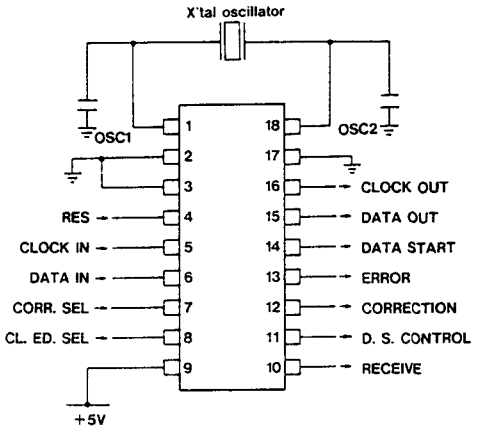
Symbol	Function
LOUD	This key operates when it is detached. LOUD is always operated when this key is detached during DK MODE is 0. DK MODE can be set and confirmed when both LOUD key and UP/DOWN key are pressed during the DK MODE is 1.
VOL UP/DOWN	Either VOLUME (DK-VOLUME), BALANCE or FADER can be controlled by Audio Mode when VOL UP/DOWN Key is switched ON. After Key is ON, a specified value is written to the electronic VOLUME, and it waits for AUDIO Mode for 10 sec. (5 sec. during DK-VOLUME). Followings are their explanations in the order of VOLUME (except during DK-VOLUME), BALANCE and FADER. (1) VOLUME Adjustment (AUDIO MODE display during VOL) VOLUME display is made immediately after the VOL UP/DOWN Key is ON, and UP/DOWN is operated. (2) BALANCE Adjustment BALANCE Adjustment can be made when the AUDIO MODE is changed to display BAL and press UP/DOWN. Step is −2dB/step as same as the VOLUME, but max. 16 step. L-ch is reduced by UP Key and R-ch is reduced by DOWN Key. VOL DATA to the step. Makes the VOL LEVEL at that time as 0dB, it descends by −2dB each time the key is pressed, and outputs −79dB at 16th step and stops descending. When VOL LEVEL is smaller than adjustable range of the BALANCE Adjustment, VOL DATA becomes −79dB before it reaches 16th step. Nevertheless, BAL Adjustment can be made until 16th step is reached. (3) FADER Adjustment FADER (front/rear) Adjustment can be made when UP/DOWN Key is pressed for AUDIO Mode FAD. The individual steps remain −2dB from 0dB to −20dB, and change −2.5dB from −20dB and −60dB from −2.5dB. There are 13 steps. This FADER Adjustment reduces either front or rear volume, because of the electronic VOLUME operation. Continuous operation when the key is kept pressed is exactly same as with VOLUME and BALANCE operation. In FADER, REAR is reduced by UP key and FRONT is reduced by DOWN key. Even when the front and rear have been imbalanced and FADER Adjustment has been made, the front and rear balance is output as flat during DK is ON, and returns to former status when the DK is OFF. (4) BAS/TRE adjustment Adjustment is carried out on BAS/TRE MODE at "0", with AUDIO MODE being set to "BAS", "TRE" and with UP/DOWN key being pushed. In total, 15 steps from −14 to +14dB in intervals of 2dB are available. With UP, it moves in plus direction (rightward) and with DOWN, in minus.
FF	When this key is pressed during STOP, PLAY or REW in PACK IN status, Fast Forward is operated in playing direction. When this key is pressed during FF (REW), head searching starts. If the head searching has been operated, it is released. When this key is ON during Blank, Skip or Repeat operation, the head searching stops and FF (REW) is operated.
REW	Functions of this key are same as for the FF key except Rewinding is made towards playing direction and the same side is played when TAPE END is reached during Rewinding.
PLAY/PRO	When this key is pressed during STOP, FF or REW operation, TAPE is played. During the head sarching, all head searching operation stop and PLAY is operated. Although the display of PLAY Key ON during BACK PLAY when the head searching operation is playing direction, Program Change is made because the rotation direction of mechanism is opposite. Therefore, when this key is pressed during PLAY operation, Program Change is always made. Difference of Program Change above: During BACK PLAY → Same side is played. During NORMAL PLAY → Reverse side is played. Also, mode can be changed from other mode to TAPE mode as same as FF and REW keys. (It can also changed from Radio mode during DK MODE=0.)
RADIO ON	RADIO ON (REMOTE) output port, regardless of DK MODE, can be controlled by RADIO ON KEY alone. With RADIO ON port at LOW (REMOTE OFF) and HS key ON, RADIO is made ON and port is set to HIGH. 1) RADIO ON Returns to the mode of RADIO OFF. With OFF, however, FF/REW returns with PLAY. 2) RADIO OFF Always causes TAPE STOP if it is in operation. Heading, DK-VOLUME setting and AUDIO MODE 10 sec. standby mode are all released. Being stopped following program change in BACK-PLAY so that running direction is met. This key always stays valid except on ACC OFF.
MUTE	Whenever MUTE Key is pressed, it switches whether to change DATA to be send to the electronic VOLUME to −20dB.

■LC7070NM 051-1150-00 Sync/Error correction LSI for RDS

I. Outward Form



II. Terminal Connection

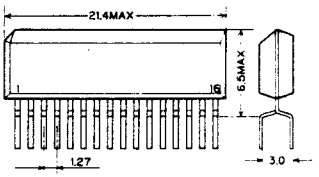


III. Terminal Connection Table

Pin No.	Symbol	Function
1 18	OSC 1 OSC 2	Connection terminal for crystal oscillator. Allows connection of 4.5MHz crystal.
2 3 17	GND	Ground.
4	RES	Reset terminal.
5	CLOCK IN	RDS recovery clock input.
6	DATA IN	RDS recovery data input.
7	CORR SEL	Correction or non correction input for input signal.
8	CL. ED. SEL	Serial output clock polarity setting input.
9	Vcc	Power supply terminal (5V).
10	RECEIVE	After finishing a synchronous detection, while serial output is made, L level output is applied. In other cases, H level output.
11	D. S. CONTROL	Data start signal control input.
12	CORRECTION	Correction output terminal.
13	ERROR	Error output terminal.
14	DATA START	Block data start signal.
15	DATA OUT	Data output for serial output.
16	CLOCK OUT	Clock output for serial output.

■TA8129Z 051-1154-00 FM IF System

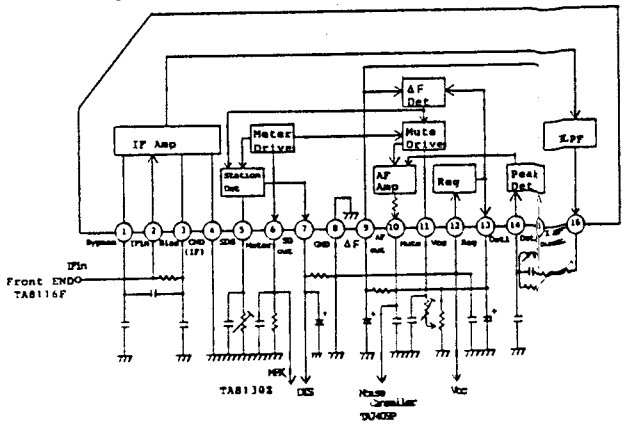
Outward Form



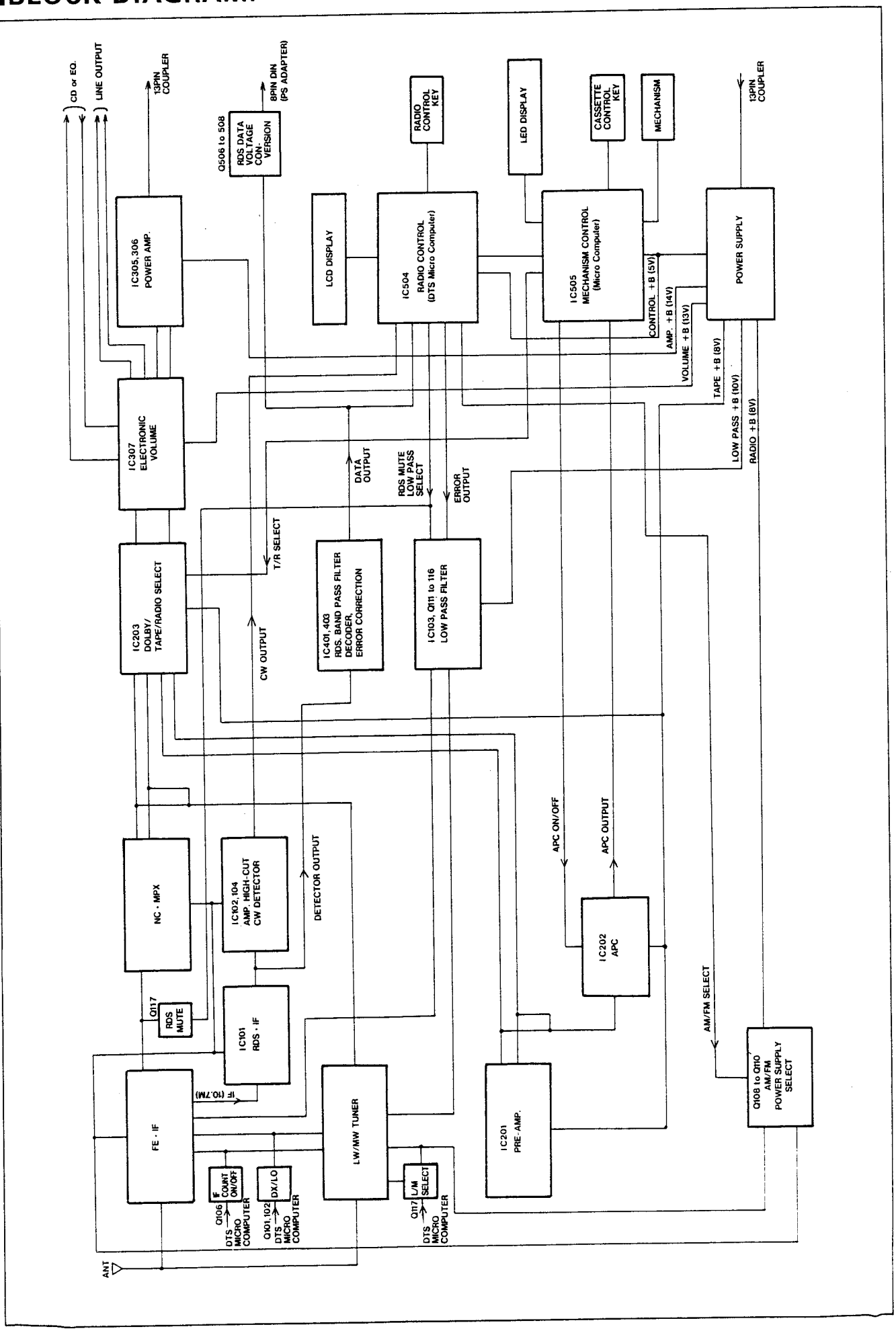
Function

- Differential 6 stage IF limiter amp.
- Signal meter output.
- Differential peak detection.
- Station detection.
- Band muting.
- Signal intensity muting.

Block Diagram



■BLOCK DIAGRAM:



■PARTS LIST:

◎Electrical section ◎MAIN P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
D106,110,111 518~521 523~530 605,608	001-0330-00 (001-0294-00) (001-0352-00)	Diode 1SS119 Diode (1SS133) Diode (1SS176)	17
D616	001-0334-00	Diode DSA17B	1
D101,303,602	001-0354-00 (001-0356-00)	Diode MA151WK Diode (1SS184)	3
D104,107	001-0354-05 (001-0356-05)	Diode MA151WA Diode (1SS181)	2
D102,108 304~306	001-0366-00	Diode LTZ-MR15	5
D103,532,533	001-0367-00	Diode 1SS226	3
D603	001-0423-16	Diode MA4043	1
D301	001-0423-18	Diode MA4051	1
D609,612	001-0423-23	Diode MA4082	2
D611	001-0423-24	Diode MA4091	1
D610	001-0423-28 (001-0421-28) (001-0425-28)	Diode MA4130 Diode (MTZ13J) Diode (HZS13J)	1
D613~615 617	001-0466-00	Diode S5688B	4
D607	001-0502-00 (001-0502-01)	Diode 1FWJ43 Diode (1GWJ43)	1
D604,606,618	001-0508-00	Diode 1SS321	3
IFT102	005-0836-00	IF-transformer MA	1
IFT101	005-1002-00	IF-transformer 291HEF-28	1
L602	010-1970-00	Coil 3.9mH	1
L102	010-2006-00	Coil	1
L503	010-2046-08	Coil	1
L501	010-2046-36	Coil	1
L101	010-2046-44	Coil 1mH	1
L502	010-2121-02	Coil	1
L601	010-2149-01	Coil	1
L603	010-2165-01	Coil	1
VR101~103	012-3808-07	Variable resistor 22kΩ VR	3
VR201,202	012-3939-05	Variable resistor 10kΩ	2
S601	013-3872-00	Switch	1
RELAY	014-0522-00	Relay	1
PL2,3	017-0337-17	Pilot lamp	2
PL1	017-0345-35	Pilot lamp	1
C605	042-0200-00	Tantalum capacitor 10V47μF	1
C140	042-0249-00	Tantalum capacitor 16V0.22μF	1
C620	042-0412-01	Double layer capacitor 5.5V1F	1
CCT3,5	050-0077-02 (050-0077-62)	Component circuit Component circuit	2
CCT2	050-0078-03	Component circuit 10kΩx5	1
CCT1	050-0090-62	Component circuit 10kΩx10	1
CCT4	050-0096-00	Component circuit 10kΩx9	1
IC103	051-0267-55	IC μPD4066BG	1
IC102,303 402	051-0350-55	IC NJM4558M	3
IC301,302 304	051-0556-01	IC NJM2058M	3
IC501	051-0569-00	IC M54563P	1
IC502	051-0570-00	IC M54522P	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
IC104,202	051-0620-00	IC LA2000C	2
IC201	051-0714-00	IC TA7705P	1
IC307	051-0866-05	IC LC7537AN	1
IC602	051-0940-00	IC S8054HN	1
IC203	051-1038-01	IC CXA1102M	1
IC601	051-1139-05 (051-1139-65)	IC TC74HC123F IC (HD74HC123AFP)	1
IC504	051-1141-00	IC LC7230	1
IC503	051-1143-00	IC S-2430I	1
IC401	051-1144-00	IC LA2231	1
IC603,604	051-1148-00	IC S8053ALR	2
IC505	051-1149-00	IC μPD75106G	1
IC403	051-1150-00	IC LC7070NM	1
IC605	051-1152-00	IC AN8006	1
IC101	051-1154-00	IC TA8129Z	1
IC606	051-1161-00	IC AN8010	1
X401	060-0115-02	Ceramic resonator	1
SUP101	060-0122-10	Surge protector	1
X501	060-0130-01	Ceramic resonator 4.19MHz	1
X402	060-0146-50	Ceramic resonator 4.0MHz	1
B.P.F	060-0177-00	Band pass filter BPF-KS-M2	1
X502	061-1053-00	Crystal 4.5MHz	1
BAT1	088-0017-01	Battery	1
BAT2	088-0024-00	Battery	1
Q602	100-1020-00	Transistor 2SA1020	1
Q117	100-1162-00	Transistor 2SA1162	1
Q109	100-1175-00	Transistor 2SA1175	1
Q108	100-1297-00	Transistor 2SA1297	1
Q101,509	100-1346-00	Transistor 2SA1346	2
Q607	100-1431-00	Transistor 2SA1431	1
Q604,606	102-1846-00	Transistor 2SC1846	2
Q603,605	102-2120-00	Transistor 2SC2120	2
Q201,402	102-2458-00	Transistor 2SC2458	2
Q107,111,112 114,115,501 502,504,601 610	102-2712-51	Transistor 2SC2712	10
Q104,608,609	102-3400-00	Transistor 2SC3400	3
Q106,150,301 302 304~307	103-1306-00	Transistor 2SD1306	8
Q105	108-0217-50	FET 2SK217	1
Q401	125-0003-03	Transistor RN2203	1
Q102,103,110 113,116,303 503,505	125-2004-03	Transistor RN1403	8
Q506~508	125-2004-04	Transistor RN1404	3
R605	116-1831-10	Chip resistor 1/8W18kΩ	1
R139	117-1001-10	Chip resistor 1/16W10Ω S	1
R149,225,310 321,329,333 335	117-1011-10	Chip resistor 1/16W100Ω S	7
R106,113,134 156,230,327 328,401,508 618	117-1021-10	Chip resistor 1/16W1kΩ S	10

REF.NO.	PART NO.	DESCRIPTION	Q'TY
111,127,128 129,135,137 138,142 213~217 R229,312 322~324 409,507 510~512 514,517,522 523,621,622	117-1031-10	Chip resistor 1/16W10kΩ S	29
104,150,151 R309,319,404 610	117-1041-10	Chip resistor 1/16W100kΩ S	7
R513,520,603 620	117-1051-10	Chip resistor 1/16W1MΩ S	4
R125	117-1221-10	Chip resistor 1/16W1.2kΩ S	1
R109,110,144 208,211	117-1231-10	Chip resistor 1/16W12kΩ S	5
R112	117-1511-10	Chip resistor 1/16W150Ω S	1
R218	117-1531-10	Chip resistor 1/16W15kΩ S	1
R124,205,206	117-1811-10	Chip resistor 1/16W180Ω S	3
131,132,140 R143 201~204 209,210	117-1831-10	Chip resistor 1/16W18kΩ S	10
103,145,152 R330,332,334 336	117-2221-10	Chip resistor 1/16W2.2kΩ S	7
R105,121,402 407,408,516	117-2231-10	Chip resistor 1/16W22kΩ S	6
R141	117-2241-10	Chip resistor 1/16W220kΩ S	1
R607	116-3301-10	Chip resistor 1/8W33Ω S	1
130,153,311 R320,337,403 405,611	117-3321-10	Chip resistor 1/16W3.3kΩ S	8
R155,301,302 303,406,608	117-3331-10	Chip resistor 1/16W33kΩ S	6
R102,207,212	117-3341-10	Chip resistor 1/16W330kΩ S	3
R120	117-4701-10	Chip resistor 1/16W47Ω S	1
R147	117-3921-10	Chip resistor 1/16W3.9kΩ S	1
R613~615	117-4711-10	Chip resistor 1/16W470Ω S	3
R108,308,318 338,515	117-4721-10	Chip resistor 1/16W4.7kΩ S	5
R115,325,326 604	117-4731-10	Chip resistor 1/16W47kΩ S	4
R148,509,606 609,617	117-5611-10	Chip resistor 1/16W560Ω S	5
R114,304,315 339,506	117-5621-10	Chip resistor 1/16W5.6kΩ S	5
R616	117-5691-10	Chip resistor 1/16W5.6Ω S	1
R101	117-8231-10	Chip resistor 1/16W82kΩ S	1
R624	117-8211-10	Chip resistor 1/16W820Ω S	1
R133,224,305 306,314,316	117-8221-10	Chip resistor 1/16W8.2kΩ S	6
C142	160-1512-05	Ceramic capacitor 150pF B HD	1
C218	171-1533-06	Ceramic capacitor 0.015μF SC	1
C118	171-6832-06	Ceramic capacitor 0.068μF SC	1
C134,607,614	172-1042-20	Polyester capacitor 0.1μF SS	3
C303,312,315 355	172-1242-20	Polyester capacitor 0.12μF SS	4
C105	172-1542-20	Polyester capacitor 0.15μF SS	1
C606,615	172-2242-20	Polyester capacitor 0.22μF SS	2
C208,209	173-1232-10	Polyester capacitor 0.012μF S	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
C201~204	173-6812-10	Polyester capacitor 680pF S	4
C421	174-2700-13	Ceramic capacitor 27pF CH TC	1
C124	176-1007-00	Ceramic chip capacitor 10pF CH TC,S	1
C503,504	176-2201-00	Ceramic chip capacitor 22pF TC,S	2
C301,314	176-2701-00	Ceramic chip capacitor 27pF CH TC,S	2
C511,512	177-1032-05	Ceramic chip capacitor 0.01μF HD	2
C413	177-3332-05	Ceramic chip capacitor 0.033μF HD	1
C116,141,621	177-4732-05	Ceramic chip capacitor 0.047μF HD	3
107,117,403 C417,505,507 509,510	178-1022-05	Ceramic chip capacitor 1000pF HD,S	8
109,110 119~121 C126,128,129 143,405,418 419,501,502 506,610	178-1032-05	Ceramic chip capacitor 0.01μF HD,S	16
C101,102,221 414	178-2232-05	Ceramic chip capacitor 0.022μF HD,S	4
C106	178-3312-05	Ceramic chip capacitor 330pF HD,S	1
115,138,146 C305,317,402 404	178-3322-05	Ceramic chip capacitor 0.0033μF HD,S	7
C104,412,601	178-3335-06	Ceramic chip capacitor 0.033μF HD,S	3
C302,312	178-3922-05	Ceramic chip capacitor 0.0039μF HD,S	2
C103	178-4722-05	Ceramic chip capacitor 0.0047μF HD,S	1
C411	178-6822-05	Ceramic chip capacitor 6800pF HD,S	1
C111,112	178-8222-05	Ceramic chip capacitor 0.0082μF HD,S	2
C618	179-1073-33	Electrolytic capacitor 16V100μF S	1
C619	179-2273-23	Electrolytic capacitor 10V220μF S	1
C508	181-4763-22	Electrolytic capacitor 10V47μF LL	1
C226,616	182-1073-22	Electrolytic capacitor 10V100μF SS	2
C147	183-1043-62	Electrolytic capacitor 50V0.1μF USS	1
125,127 C135~137 143,213,224 307,319,354	183-1053-62	Electrolytic capacitor 50V1μF USS	11
108,130,205 C215,216,220 222,225,229 323,324,420	183-1063-32	Electrolytic capacitor 16V10μF USS	12
C227,409,604	183-1073-12	Electrolytic capacitor 6.3V100μF USS	3
C131 326~331	183-2253-62	Electrolytic capacitor 50V2.2μF USS	7
C401,408,415 416	183-2263-32	Electrolytic capacitor 16V22μF USS	4
C145	183-3343-62	Electrolytic capacitor 50V0.33μF USS	1
144,211,212 214,217,304 C306,310,316 318,321,322 407	183-4753-52	Electrolytic capacitor 35V4.7μF USS	13
C113,219,308 320	183-4743-62	Electrolytic capacitor 50V0.47μF USS	4
122,123,132 133,139,206 C207,210,325 410,422,603 608,609,611 612,613,617	183-4763-32	Electrolytic capacitor 16V47μF USS	18
C223,228	183-6843-62	Electrolytic capacitor 50V0.68μF USS	2

◎AUDIO P.W.B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
IC305	051-0655-01	IC TA7270PCL	1
IC306	051-0656-01	IC TA7271PCL	1
R342,343	116-1031-10	Chip resistor 1/8W10kΩ	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
R352,355	116-1221-10	Chip resistor 1/8W1.2kΩ	2
R353,354	116-1501-10	Chip resistor 1/8W15Ω	2
R340,341	116-1831-10	Chip resistor 1/8W18kΩ	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
R344~347	116-3301-10	Chip resistor 1/8W33Ω	4
R348,351	116-5621-10	Chip resistor 1/8W5.6kΩ	2
C336,342	160-6812-05	Ceramic capacitor 680pF B HD	2
344,347 C349~352 370,371	173-1542-10	Polyester capacitor 0.15μF S	8

REF.NO.	PART NO.	DESCRIPTION	Q'TY
337~340 C343,345,346 348	179-1073-22	Electrolytic capacitor 10V100μF S	8
C341,356	179-2263-32	Electrolytic capacitor 16V22μF S	2
C353	179-2283-31	Electrolytic capacitor 16V2200μF S	1
C332~335	182-1053-62	Electrolytic capacitor 50V1μF SS	4

◎NC/MPX BLOCK Ass'y 880-0304B

REF.NO.	PART NO.	DESCRIPTION	Q'TY
VR_1	012-3707-05	Variable resistor (VR10kΩ)	1
VR_2	012-3707-08	Variable resistor (VR100kΩ)	1
CCT_1	050-0099-50	Component circuit	1
IC_1	051-0407-00	IC (LA2110)	1
IC_2	051-0733-01	IC (LA3430)	1
X_1	060-0115-02	Ceramic resonator	1
Q_1	102-2458-49	Transistor (2SC2458-YGR)	1
$R_{2,12}$	117-1041-10	Chip resistor (1/16W100kΩ) S	2
$R_{8,9}$	117-2221-10	Chip resistor (1/16W2.2kΩ) S	2
R_{14}	117-2231-10	Chip resistor (1/16W22kΩ) S	1
R_6	117-3331-10	Chip resistor (1/16W33kΩ) S	1
R_{10}	117-3921-10	Chip resistor (1/16W3.9kΩ) S	1
R_1	117-1021-10	Chip resistor (1/16W1kΩ) S	1
$R_{4,11,13}$	117-5621-10	Chip resistor (1/16W5.6kΩ) S	3

REF.NO.	PART NO.	DESCRIPTION	Q'TY
R_5	117-6821-10	Chip resistor (1/16W6.8kΩ) S	1
R_3	117-8211-10	Chip resistor (1/16W820Ω) S	1
C_6	171-2223-06	Ceramic capacitor (0.0022μF) SC	1
C_{16}	171-3333-06	Ceramic capacitor (0.033μF) SC	1
C_7	171-4733-06	Ceramic capacitor (0.047μF) SC	1
$C_{2,3}$	178-1032-05	Ceramic chip capacitor (0.01μF) HD,S	2
C_{10}	178-2232-05	Ceramic chip capacitor (0.022μF) HD,S	1
C_9	178-4722-05	Ceramic chip capacitor (0.0047μF) HD,S	1
$C_{4,15}$	178-6822-05	Ceramic chip capacitor (0.0068μF) HD,S	2
$C_{11,12}$	182-1053-62	Electrolytic capacitor (50V1μF) SS	2
C_{14}	182-1063-32	Electrolytic capacitor (16V10μF) SS	1
C_{13}	182-2243-62	Electrolytic capacitor (50V0.22μF) SS	1
C_5	182-2263-32	Electrolytic capacitor (16V22μF) SS	1
$C_{1,8}$	182-4753-52	Electrolytic capacitor (35V4.7μF) SS	2

◎TAPE MECHANISM ELECTRICAL PARTS

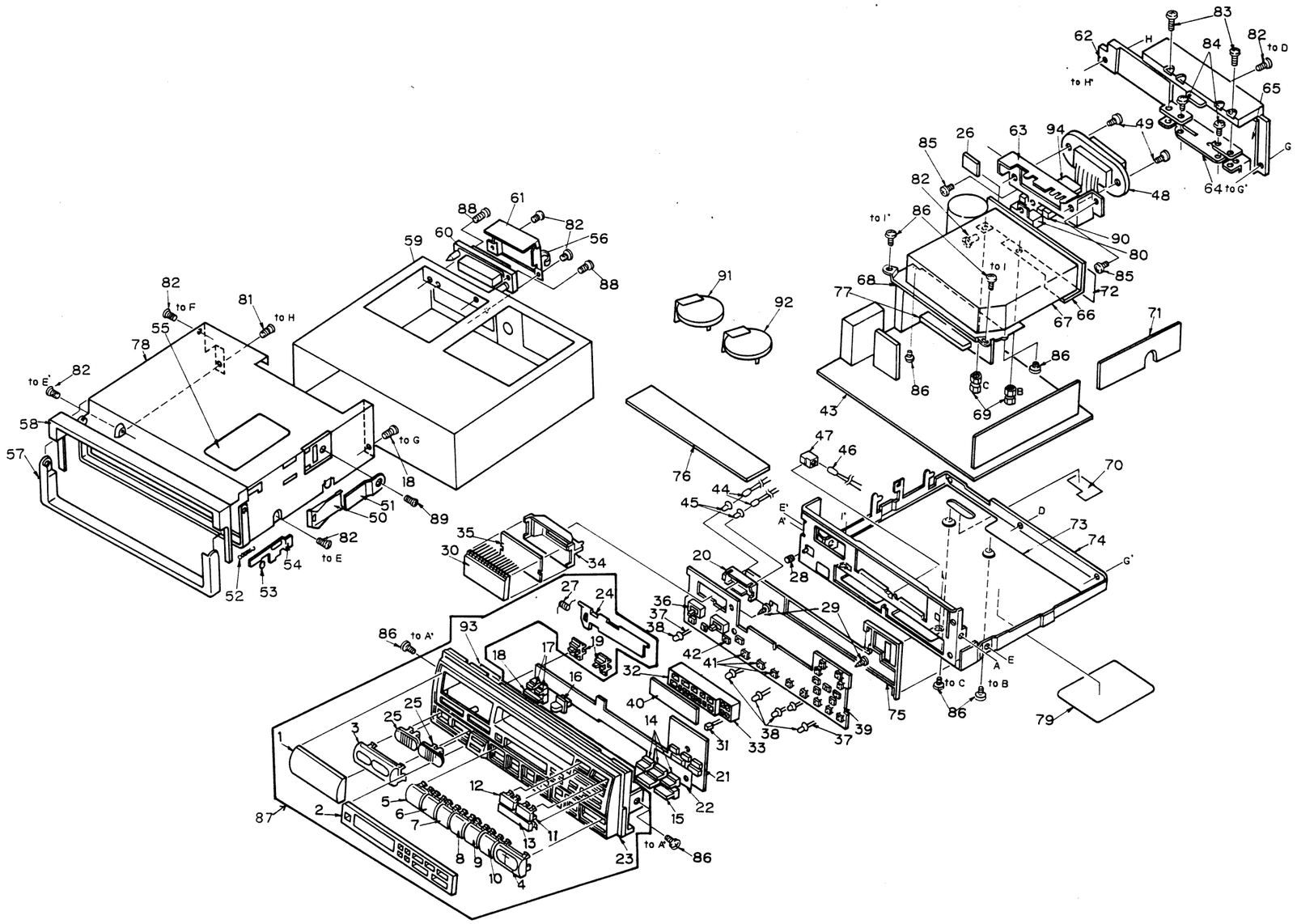
REF.NO.	PART NO.	DESCRIPTION	Q'TY
D701~704	001-0330-00	Diode 1SS119	4
Q701	100-1048-00	Transistor 2SA1048	1
Q702,704	100-1297-00	Transistor 2SA1297	2

REF.NO.	PART NO.	DESCRIPTION	Q'TY
Q703,705	102-3267-50	Transistor 2SC3267GR,BL	2
R709	114-2291-11	Film resistor 1W2.2Ω OM	1
C701	182-1073-32	Electrolytic capacitor 16V100μF SS	1

NOTE : OM (Oxidized Metal) SS (Super Small)
S (Small) TC (Temperature-Compensating)
HD (Higher Dielectric) LL (Low Leak)
SC (Semi-Conductor) USS (Ultra Super Small)

■EXPLODED VIEW • PARTS LIST:

◎Main section



REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	373-0536-01	Dial cover	1
2	373-0537-00	Dial cover	1
3	382-1689-00	Button (LEVEL)	1
4	382-1690-00	Button (TUNE)	1
5	382-1691-00	Button (1)	1
6	382-1691-01	Button (2)	1
7	382-1691-02	Button (3)	1
8	382-1691-03	Button (4, BLS)	1
9	382-1691-04	Button (5, RPT)	1
10	382-1691-05	Button (6, □□B)	1
11	382-1692-00	Button (EJECT)	1

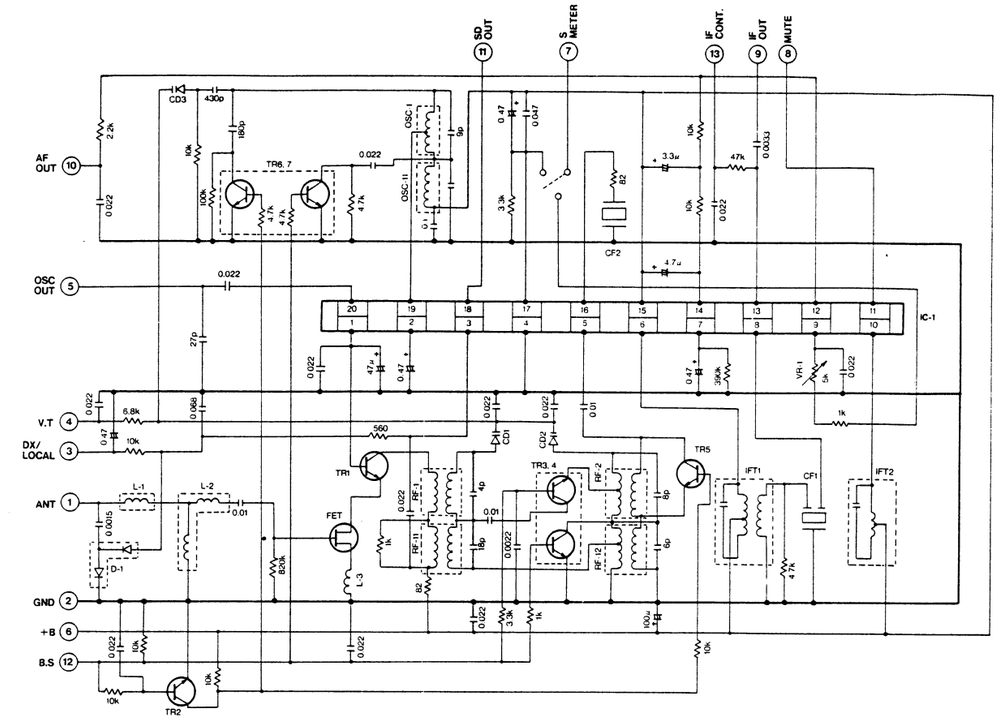
REF.NO.	PART NO.	DESCRIPTION	Q'TY
12	382-1692-01	Button (PRO)	1
13	382-1693-00	Button (FF/REW)	1
14	382-1694-00	Button (PI, TP, SAM)	3
15	382-1695-00	Button (BAND, T-MODE)	2
16	382-1696-00	Button (POWER ON)	1
17	382-1697-00	Button (LD/MUTE)	2
18	382-1698-00	Button (A-MODE)	1
19	374-0906-00	Back plate	2
20	335-2613-00	LCD reflector	1
21	345-4615-00	Switch plate	1
22	347-2488-00	White reflector	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
23	370-5068-01	Escutcheon	1
24	320-0431-02	Dustproof cover (971HX)	1
25	380-5023-00	Knob	2
26	345-4306-00	Spacer	1
27	750-2626-00	Spring	1
28	750-2777-00	Spring	1
29	702-2006-81	Tap screw (2x6)	2
30	379-0222-00	LCD	1
31	001-0487-04	LED (AMBER)	15
32	001-0487-00	LED (RED)	3
33	335-2611-00	LED reflector	1

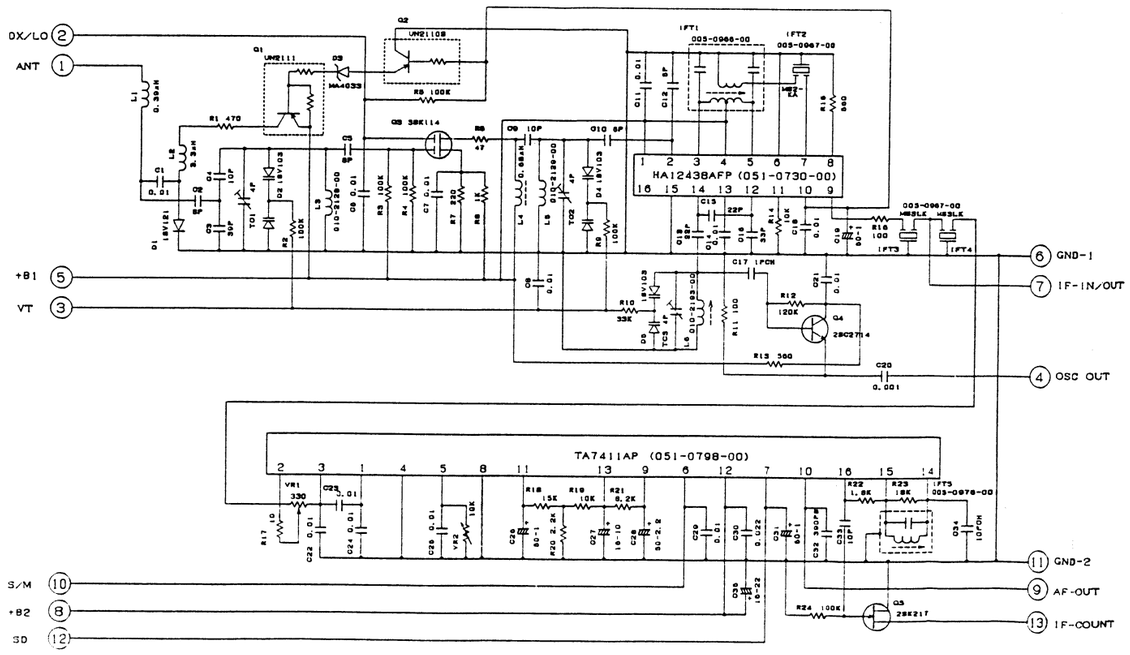
REF.NO.	PART NO.	DESCRIPTION	Q'TY
34	335-2612-01	LCD holder	1
35	335-2616-03	Diffusion plate	1
36	012-4662-00	Slide volume	2
37	017-0377-00	Pilot lamp (16V 36mA)	6
38	345-4441-01	P.L cap	6
39	099-8465-00	P.W.B	1
40	371-3482-00	Trim plate	1
41	013-3694-00	Tact switch (6x6)	14
42	013-3812-00	Tact switch (3.5x6)	9
43	099-8460-00	P.W.B	1
44	017-0337-17	Pilot lamp (8V)	2
45	345-3436-26	P.L cap	2
46	017-0345-35	Pilot lamp (14V)	1
47	345-3335-07	P.L cap	1
48	854-0879-00	Extension lead	1
49	714-4012-11	Machine screw (M4x12)	2
50	330-8578-00	Hook plate	1
51	750-2625-00	Spring	1
52	750-2624-00	Spring	1
53	743-2500-10	E-ring	1
54	330-8577-00	Lever	1
55	285-0915-00	Guide label	1
56	335-0833-01	Lead clamp	2
57	335-2459-00	Handle cover	1
58	370-4006-02	Escutcheon	1
59	300-7347-03	Mounting bracket	1
60	854-0878-01	Extension lead	1
61	330-8983-00	Shield case	1
62	313-1295-00	Heat sink	1
63	330-8604-01	Lead holder	1
64	330-8575-00	IC holder	1
65	099-8466-00	P.W.B (AUDIO)	1
66	330-8402-02	Shield case	1
67	930-0530-20	Tape mechanism (4F-700AH)	1
68	330-8733-00	Mechanism bracket	1
69	716-0375-00	Screw (Hexagon)	2
70	347-2776-00	Insulator	1
71	347-2495-00	Insulator	1
72	347-2831-00	Insulator	1
73	347-2753-00	Insulator	1
74	311-1311-00	Lower case	1
75	374-0902-00	Back plate	1
76	347-2474-00	Insulator	1
77	345-3299-02	Cushion rubber	1
78	310-1309-01	Upper case	1
79	286-7098-00	Set plate (Dolby, Serial)	1
80	330-8605-00	Fuse holder	1
81	731-3008-80	Tap tight (M3x8)	2
82	731-3006-80	Tap tight (M3x6)	7
83	714-3006-81	Machine screw (M3x6)	2
84	714-3004-11	Machine screw (M3x4)	2
85	702-3006-81	Tapping screw (3x6)	2
86	714-3005-81	Machine screw (M3x5)	8
87	940-0995A	Escutcheon ass'y	1
88	731-3010-80	Tap tight (M3x10)	2
89	714-3005-40	Machine screw (M3x5)	1
90	077-0082-00	Fuse receptacle	1
91	088-0017-01	Battery	1
92	088-0024-00	Battery	1
93	347-2693-00	Spacer	1
94	060-0057-05	Auto fuse (7.5A)	1

■TUNER PACK:

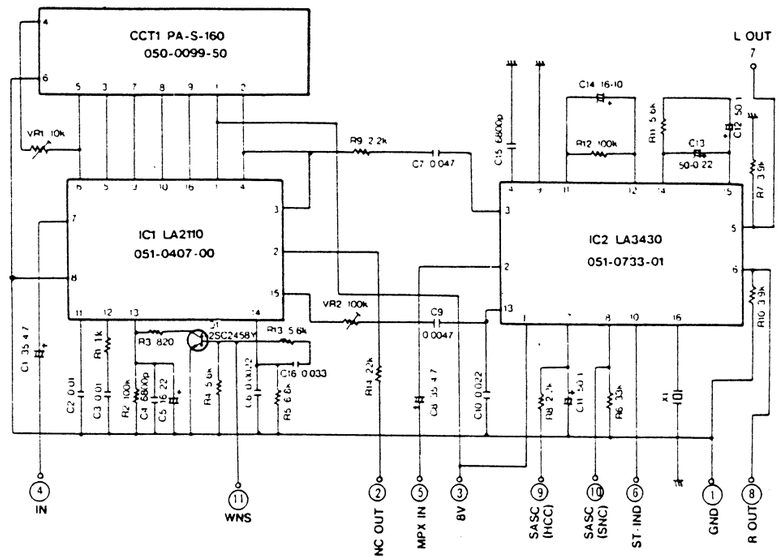
◎MW/LW TUNER PACK 941-0177-00



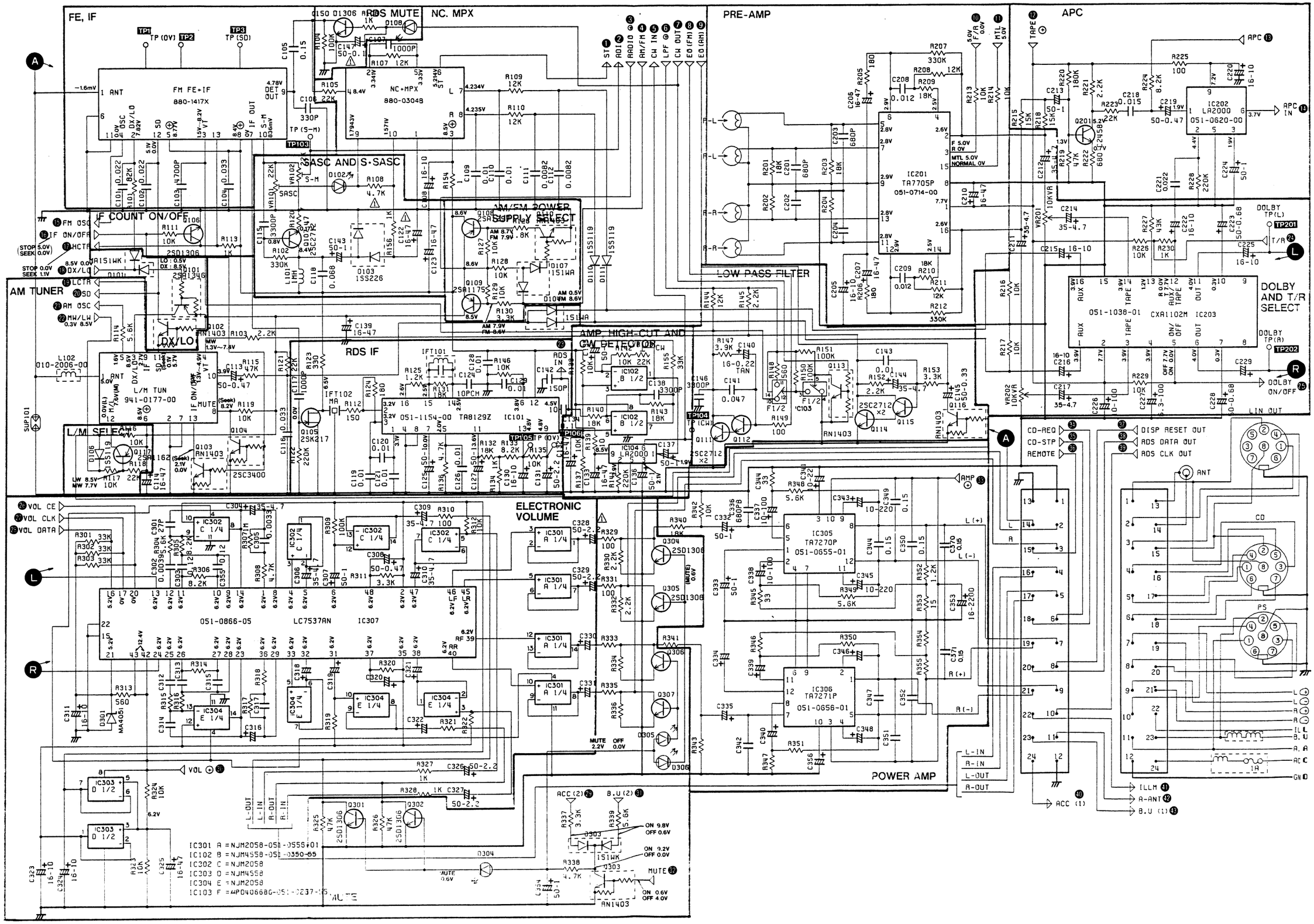
◎UKW TUNER PACK 880-1417X



◎NC/MPX BLOCK Ass'y 880-0304B



■CIRCUIT DIAGRAM: 1/2



■CIRCUIT DIAGRAM: 2/2

RDS, BAND PASS. DECODER, ERROR CORRECTION

RADIO CONTROL

RDS DATA VOLTAGE CONVERSION

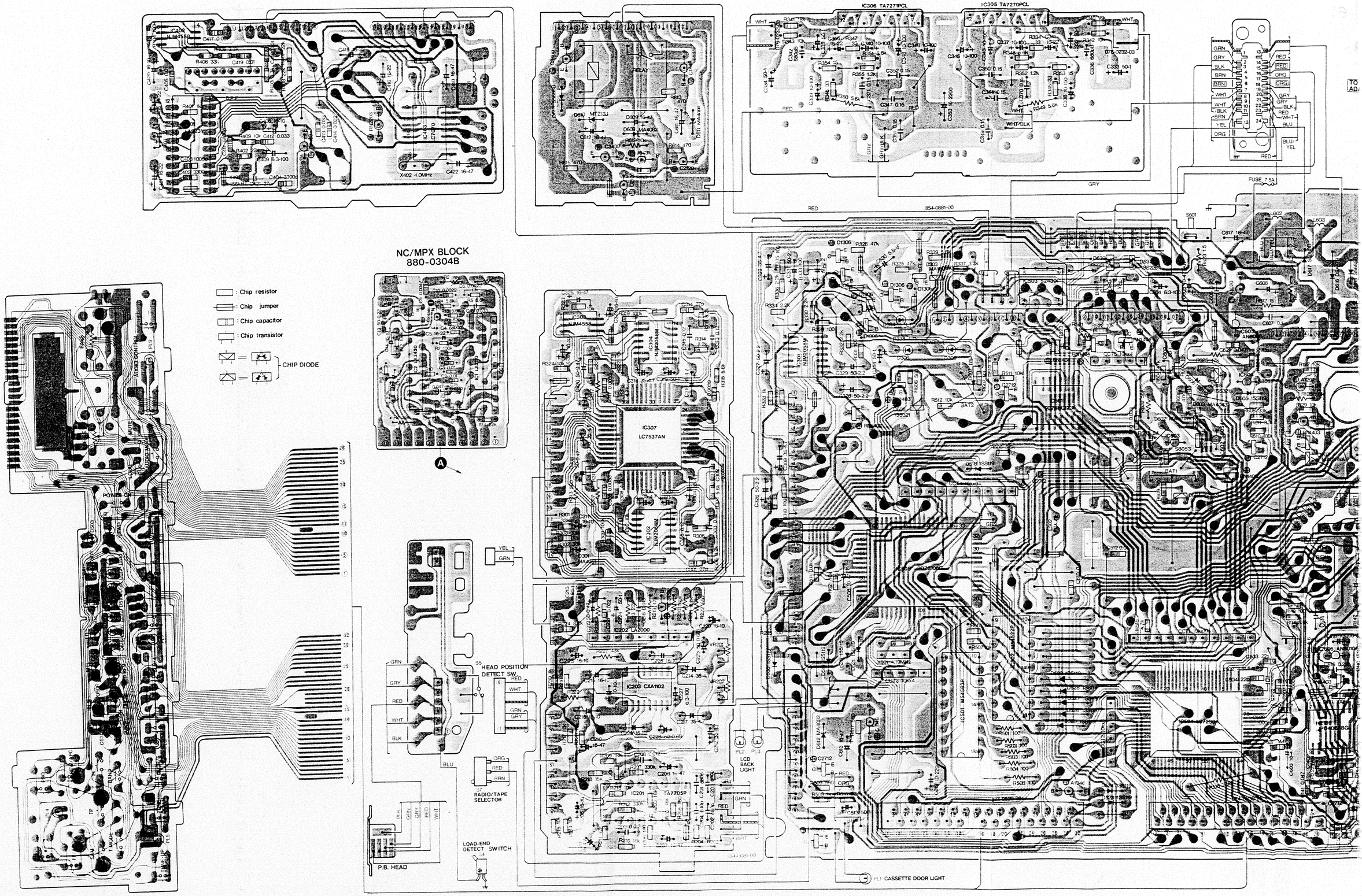
LED DISPLAY

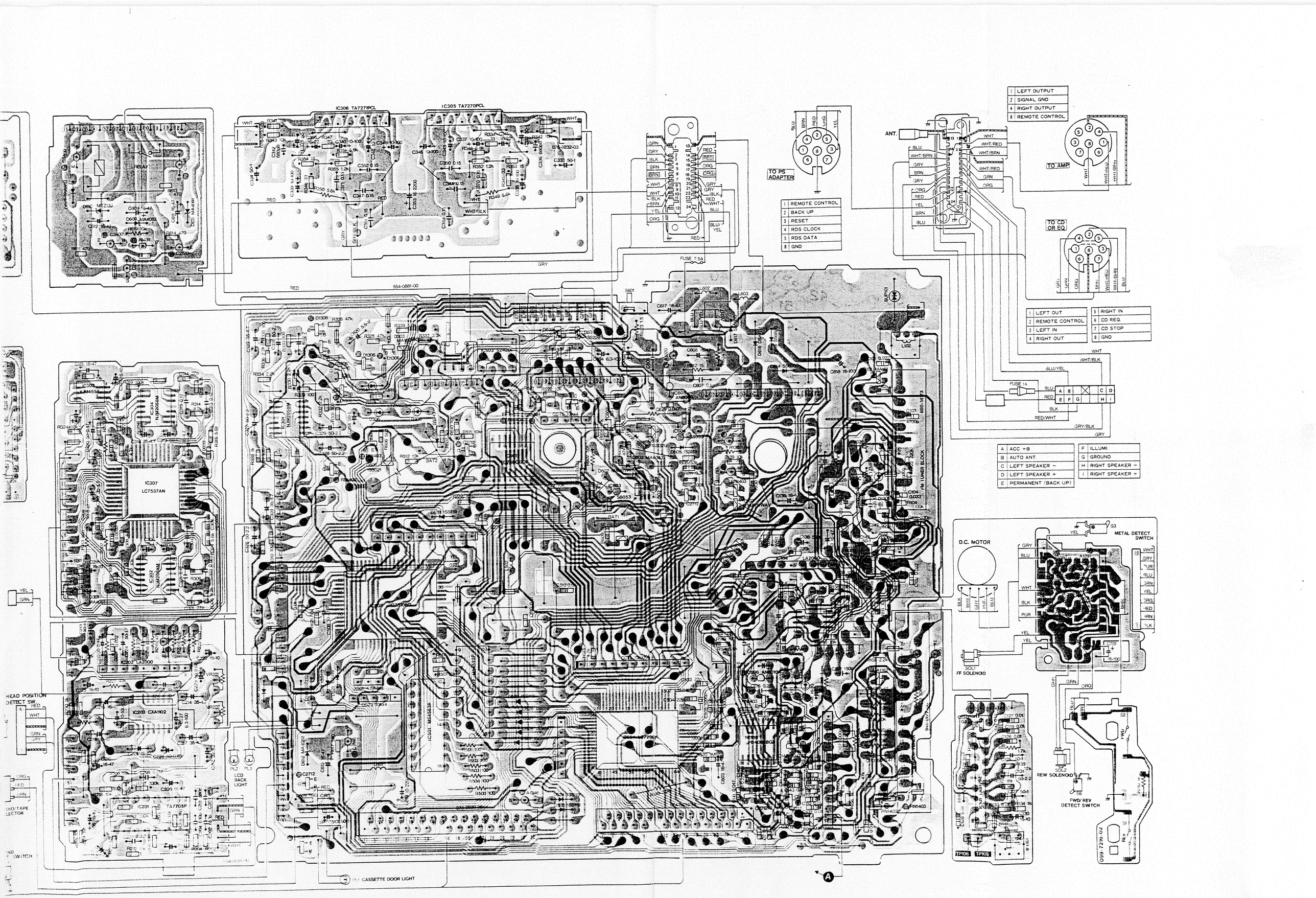
MECHANISM CONTROL

POWER SUPPLY

ILLUMI

■PRINTED WIRING BOARD:



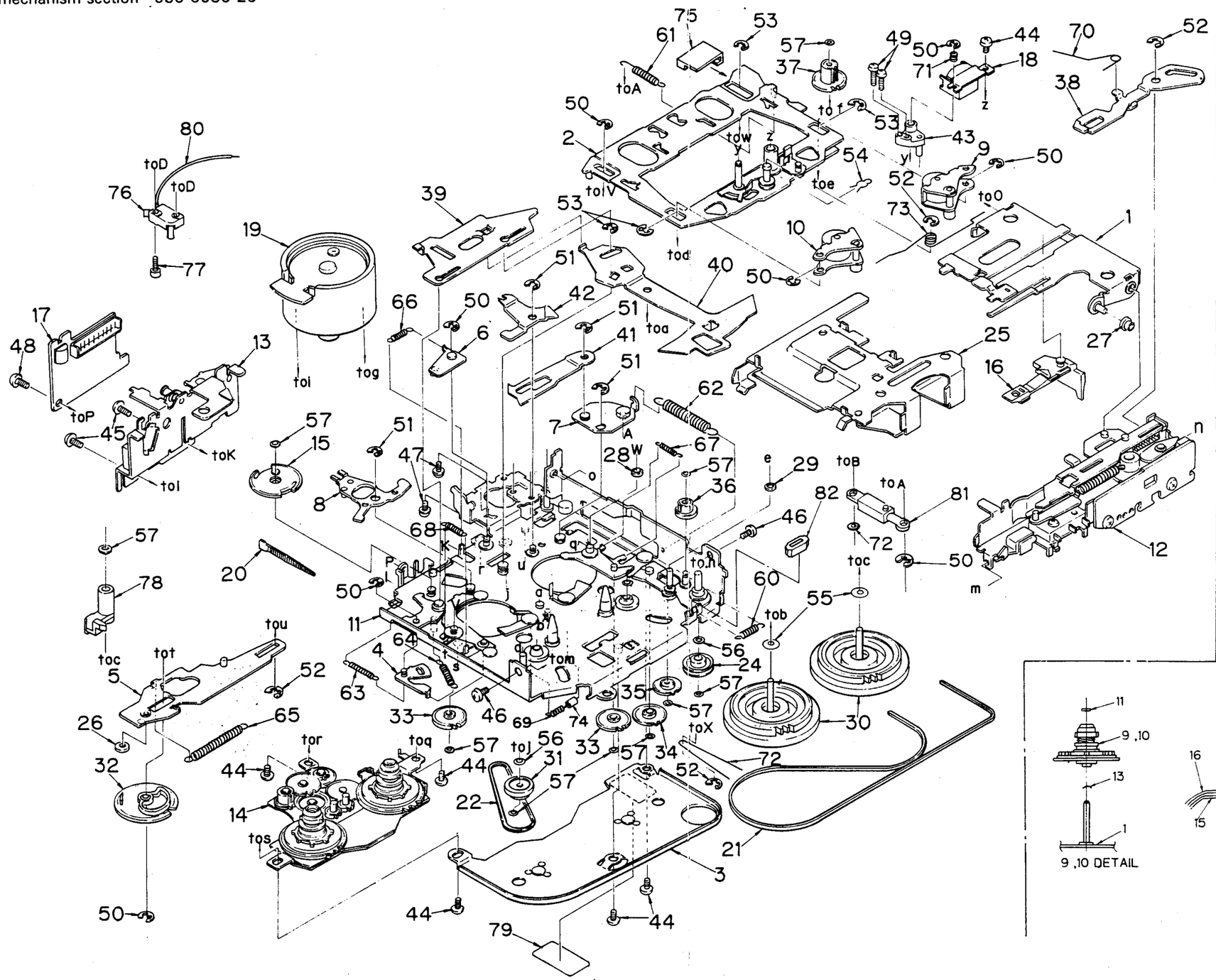

IC306 TA7271PCL
IC305 TA7270PCL
RELAY
954-0881-00
FUSE 7.5A
TO PS ADAPTER
1 REMOTE CONTROL
2 BACK UP
3 RESET
4 RDS CLOCK
5 RDS DATA
8 GND
1 LEFT OUTPUT
2 SIGNAL GND
4 RIGHT OUTPUT
8 REMOTE CONTROL
ANT.
TO AMP
TO CD QR EQ
1 LEFT OUT
2 REMOTE CONTROL
3 LEFT IN
4 RIGHT OUT
5 RIGHT IN
6 CD REQ.
7 CD STOP
8 GND
A ACC +B
B AUTO ANT.
C LEFT SPEAKER −
D LEFT SPEAKER +
E PERMANENT (BACK UP)
F ILLUMI.
G GROUND
H RIGHT SPEAKER −
I RIGHT SPEAKER +
IC307 LC7537AN
IC202 CXA1102
IC201 TA7705P
IC501 M54563P
IC601 AN8809SB
D.C. MOTOR
METAL DETECT SWITCH
FF SOLENOID
REW SOLENOID
FWD/REV DETECT SWITCH
HEAD POSITION DETECT SW.
LCD BACK LIGHT
CASSETTE DOOR LIGHT
TP106
TP105

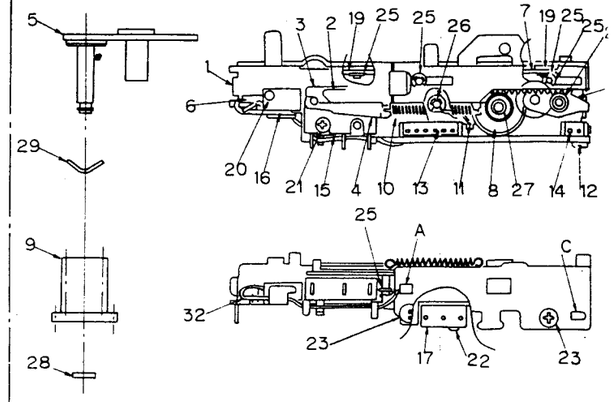
971HX

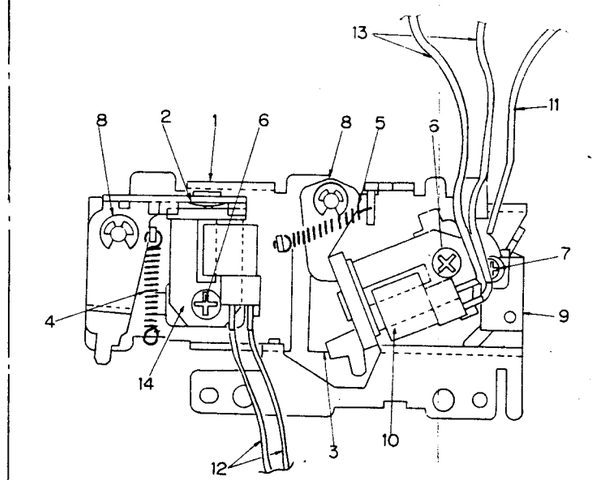
971HX

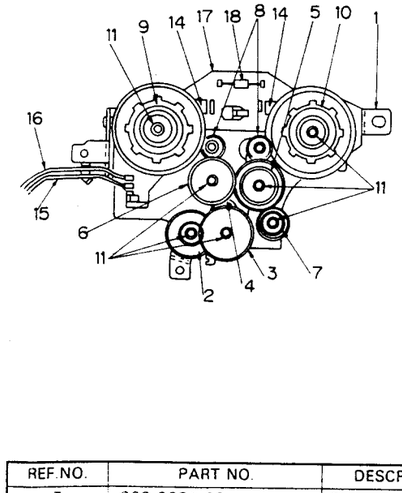
■EXPLODED VIEW • PARTS LIST:

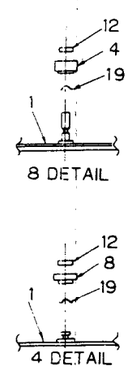
◎Tape mechanism section 930-0530-20











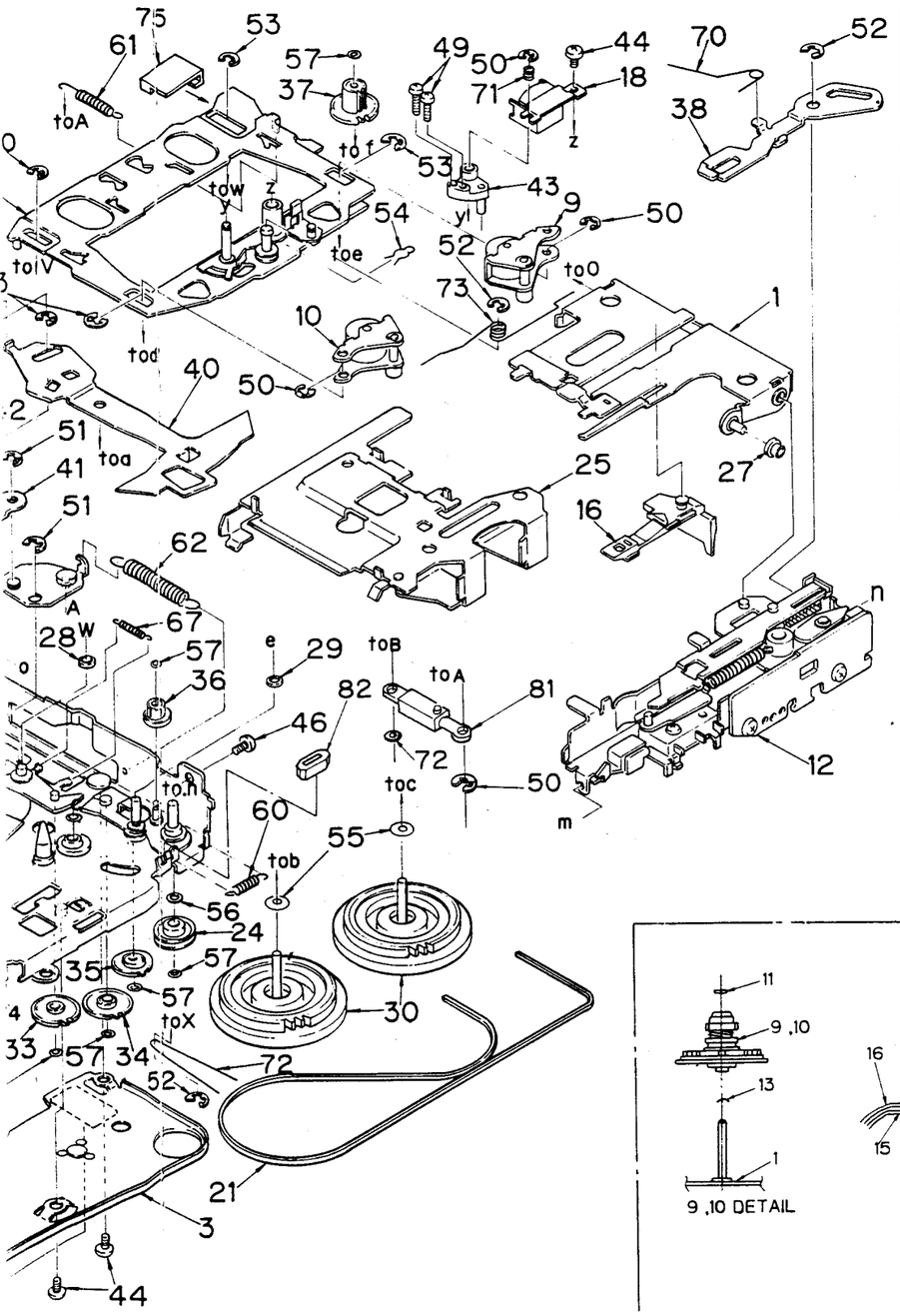
⑭960

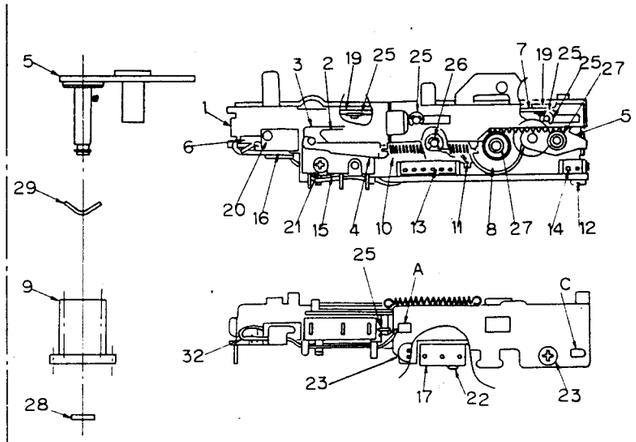
NO	P#
1	960
2	613
3	613
4	613
5	613
6	613
7	613
8	613
9	960
10	960
11	748
12	748
13	747
14	013
15	802
16	801
17	095
18	111
19	745

REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	960-3609-05	Guide arm ass'y	1
2	960-3612-09	Head plate ass'y	1
3	960-3617-00	Flywheel-P ass'y	1
4	960-3626-02	Timing-P ass'y	1
5	960-3627-04	Power-P ass'y	1
6	960-3628-01	P-lock-P ass'y	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
7	960-3631-06	Power link ass'y	1
8	960-3632-02	REW-link ass'y	1
9	960-3738-02	Roller-F ass'y	1
10	960-3739-02	Roller-R ass'y	1
11	960-3638-12	Deck plate ass'y	1
12	960-3639-09	Frame-sub ass'y	1

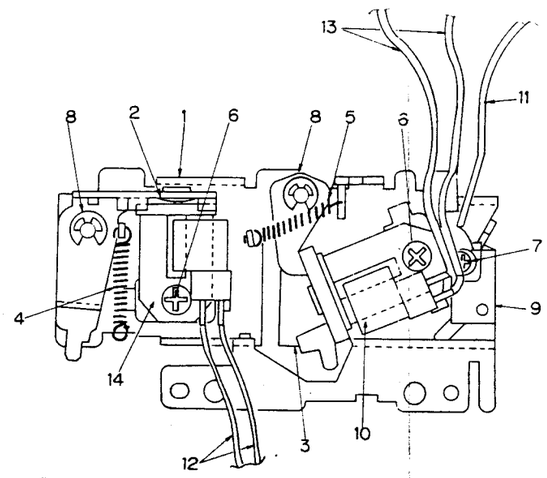
REF.NO.
13
14
15
16
17
18





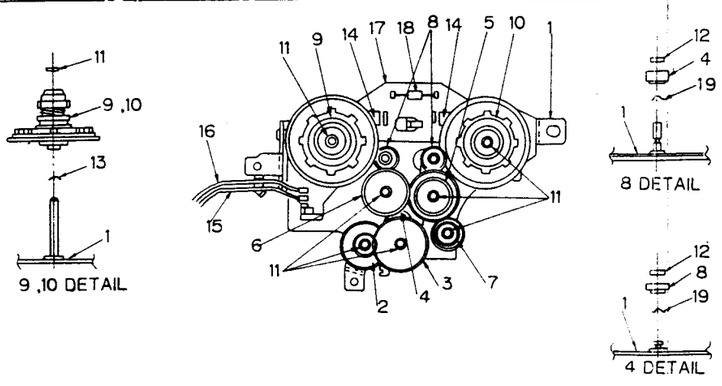
⑫960-3639-09 Frame-sub ass'y

NO	PART NO.	DESCRIPTION	Q'TY
1	960-3611-04	FRAME-ASS'Y	1
2	960-3619-03	EJ-ARM-P-ASS'Y	1
3	630-1758-03	EJ-RACK PLATE	1
4	960-3621-02	SW-LINK-ASS'Y	1
5	960-3620-06	SWING-P-ASS'Y	1
6	820-3005-02	VINYL-TUBE	1
7	960-3618-03	EJECT-P-ASS'Y	1
8	613-0076-02	EJECT GEAR	1
9	613-0075-02	SWING GEAR	1
10	750-2404-00	EJ-RACK SPRING	1
11	750-2419-01	EJ-GEAR SPRING	1
12	099-7435-03	P W B	1
13	076-0277-06	PLUG	1
14	076-0277-02	PLUG	1
15	013-2690-05	SWITCH	1
16	013-3757-00	SWITCH	1
17	013-3780-00	SWITCH	1
18	806-0607-60	VINYL-COAT-WIRE	1
19	610-0268-00	EJECT ROLLER	2
20	716-0670-00	SCREW	1
21	714-2308-11	MACHINE SCREW(M2 3×8)	1
22	716-0656-00	SCREW	1
23	716-0777-01	SCREW	2
25	743-1500-10	E-RING	5
26	743-2000-10	E-RING	1
27	745-0761-00	WASHER	2
28	746-0762-00	WASHER	1
29	745-0737-00	WASHER	1



⑬960-3640-09 Side-P-sub ass'y

NO	PART NO.	DESCRIPTION	Q'TY
1	960-3610-08	SIDE PANEL-ASS'Y	1
2	960-3623-05	PL-LINK-A-ASS'Y	1
3	960-3624-06	PL-LINK-B-ASS'Y	1
4	750-2408-00	PL-SPRING-A	1
5	750-2409-02	PL-SPRING-B	1
6	714-2606-11	MACHINE SCREW(M2 6×6)	2
7	716-0670-00	SCREW	1
8	743-1500-10	E-RING	2
9	013-3757-00	SWITCH	1
10	015-0232-02	PLUNGER	1
11	803-0608-60	VINYL-COAT-WIRE	1
12	804-0606-60	VINYL-COAT-WIRE	2
13	805-0609-60	VINYL-COAT-WIRE	2
14	015-0238-00	PLUNGER	1



⑭960-3641-07 Reel-B-sub ass'y

NO	PART NO	DESCRIPTION	Q'TY
1	960-3613-05	REELBASE-P-ASS'Y	1
2	613-0061-01	POWER GEAR A	1
3	613-0062-00	POWER GEAR B	1
4	613-0066-02	P IDLER GEAR	1
5	613-0063-00	POWER GEAR C	1
6	613-0064-01	POWER GEAR D	1
7	613-0065-00	POWER GEAR E	1
8	613-0069-00	IDLER GEAR	2
9	960-3634-02	REELBASE-F-ASS'Y	1
10	960-3635-02	REELBASE-R-ASS'Y	1
11	746-0761-00	WASHER	7
12	746-0762-00	WASHER	3
13	746-0712-01	WASHER	2
14	013-3707-00	SWITCH	2
15	802-0615-60	VINYL-COAT-WIRE	1
16	801-0615-60	VINYL-COAT-WIRE	1
17	099-7216-02	P W B	1
18	111-1021-91	FILM RESISTOR(1 4W±1(Ω)	1
19	745-0678-01	WASHER	3

REF.NO.	PART NO.	DESCRIPTION	Q'TY
1	960-3609-05	Guide arm ass'y	1
2	960-3612-09	Head plate ass'y	1
3	960-3617-00	Flywheel-P ass'y	1
4	960-3626-02	Timing-P ass'y	1
5	960-3627-04	Power-P ass'y	1
6	960-3628-01	P-lock-P ass'y	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
7	960-3631-06	Power link ass'y	1
8	960-3632-02	REW-link ass'y	1
9	960-3738-02	Roller-F ass'y	1
10	960-3739-02	Roller-R ass'y	1
11	960-3638-12	Deck plate ass'y	1
12	960-3639-09	Frame-sub ass'y ⑫	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
13	960-3640-09	Side-P-sub ass'y ⑬	1
14	960-3641-07	Reel-B-sub ass'y ⑭	1
15	960-3642-03	CH-gear ass'y	1
16	960-3643-03	Pack-ST ass'y	1
17	099-7670-03	P W B	1
18	011-0308-00	Head	1

REF.NO.	PART NO.	DESCRIPTION	Q'TY
19	SMA-105-100	Motor ass'y	1
20	335-0833-01	Clamp	1
21	602-0097-01	Belt-A	1
22	602-0098-02	Belt-B	1
23	750-2421-00	Change-A spring	1
24	604-0033-00	Tension pulley	1
25	606-0079-06	Pack guide	1
26	610-0266-00	Cam roller	1
27	610-0267-00	Guide roller	1
28	610-0281-00	Head-P-roller	1
29	610-0282-00	H-P-roller B	1
30	611-0072-02	Flywheel	2
31	613-0060-02	Pulley gear	1
32	613-0067-05	Cam gear	1
33	613-0070-00	FF-gear	2
34	613-0071-00	Loading gear-A	1
35	613-0072-00	Loading gear-B	1
36	613-0073-00	Loading gear-C	1
37	613-0074-01	Loading gear-D	1
38	630-1759-03	Eject arm	1
39	630-1760-02	Change plate	1
40	630-1761-00	Change arm	1
41	630-1762-03	Head lock plate	1
42	630-1763-01	FF-link	1
43	631-0461-02	Azimuth link	1
44	714-2003-81	Machine screw (M2×3)	6
45	714-2603-81	Machine screw (M2.6×3)	2
46	714-2604-81	Machine screw (M2.6×4)	2
47	716-0347-00	Screw (MOTOR)	2
48	716-0777-00	Screw (P.W.B)	1
49	716-0654-02	Screw (AZIMUTH)	2
50	743-1500-10	E-ring (M1.5)	8
51	743-2000-10	E-ring (M2)	4
52	743-2500-10	E-ring (M2.5)	4
53	744-0031-10	E-ring	4
54	744-0028-00	Snap retainer	1
55	745-0646-00	Washer (FLYWHEEL)	2
56	746-0624-00	Washer	2
57	746-0761-00	Washer	10
60	750-2405-02	Loading spring	1
61	750-2406-03	Head-P-spring	1
62	750-2407-03	P-link spring	1
63	750-2410-00	G-lock spring	1
64	750-2411-00	Timing spring	1
65	750-2412-00	Power-P-spring	1
66	750-2413-00	P-lock spring	1
67	750-2414-02	FF-spring	1
68	750-2415-01	REW-spring	1
69	750-2416-01	Brake spring	1
70	750-2418-02	EJ-arm spring-B	1
71	750-2420-00	Azimuth spring	1
72	746-0762-00	Washer	1
73	750-2422-03	Roller spring	1
74	820-4006-02	Vinyl tube	1
75	631-0540-00	Stopper B	1
76	013-3757-00	Switch	1
77	716-0670-00	Screw	1
78	631-0528-01	Sensor link	1
79	290-4065-01	Care label	1
80	804-0608-60	Vinyl coat	1
81	960-3824-00	Dumper ass'y	1
82	631-0539-01	Stopper A	1

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